

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**KUMASI, GHANA**

**THE EFFECT OF ENVIRONMENTAL TRAINING ON GREEN LOGISTICS  
MANAGEMENT PRACTICES AND SUPPLIER ENVIRONMENTAL  
ORIENTATION: THE MODERATING ROLE OF TOP MANAGEMENT  
COMMITMENT AND CORPORATE ENVIRONMENTAL ORIENTATION**

**By**

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**A thesis submitted to the department of supply chain and information systems,  
institute off distance learning, in partial fulfilment of the requirement for the**

**award of the degree of**

**Master of Philosophy**

**In**

**Logistics and supply chain management**

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## DECLARATION

I hereby declare that this submission is my own work towards the award of the Master of Philosophy in Logistics and Supply Chain Management. To the best of my knowledge, it contains no material previously published by another person, nor material that has been accepted for the award of any degree of the university, except where due acknowledgment has been made in the text.

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## DEDICATION

I dedicated this piece of work first and foremost to God Almighty for his grace and protection throughout my study.

I again dedicate this work to my family and my wife Faustina Tuah for their moral support and to my mentor, Dr. Daniel Etse, who guided me through this academic journey with unwavering patience and support. Your unwavering encouragement and belief in my abilities have been a constant source of motivation and inspiration throughout this thesis work. This accomplishment would not have been possible without your guidance and support



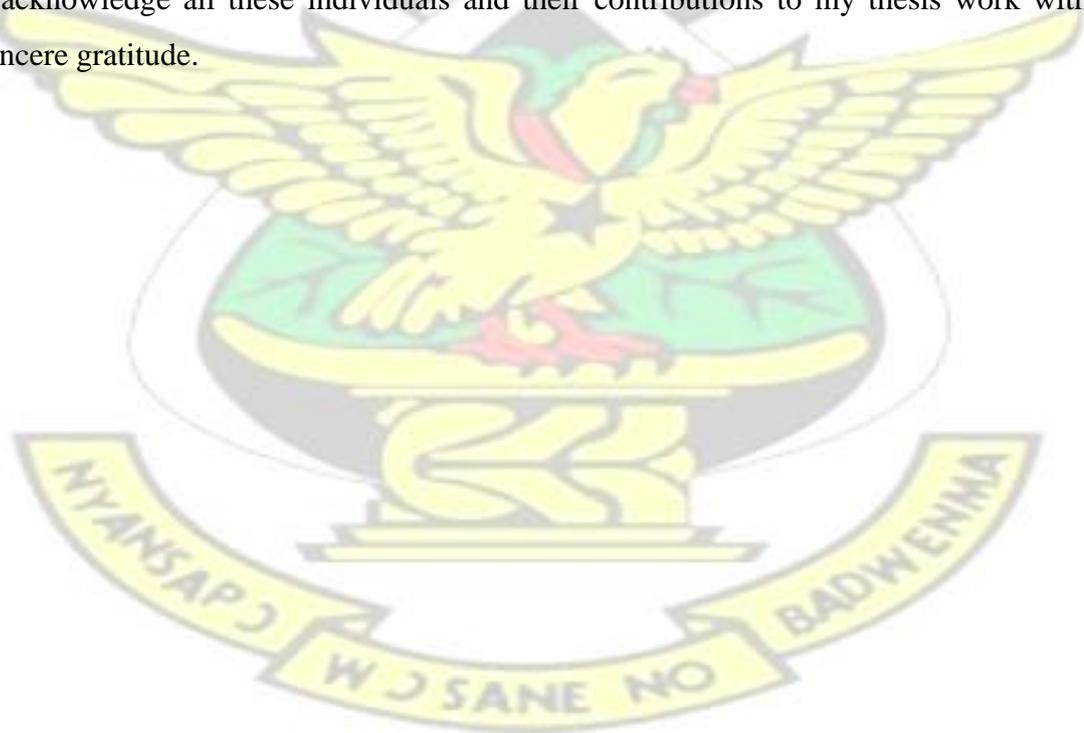
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## ABSTRACT

In response to escalating environmental concerns arising from industrial activities, this study investigates the influence of environmental training on the adoption of green logistics management practices. The objectives of the study were to: examine the relationship between environmental training and green logistics management practices, examine the mediating role of supplier environmental orientation in the relationship between environmental training and green logistics management practices, to investigate the moderating effect of top management commitment on the relationship between environmental training and supplier environmental orientation, to examine how corporate environmental orientation moderates the relationship between environmental training and green logistics management practices. A quantitative survey methodology was employed as the research design. A total of 290 firms in Ghana were sampled for this study. The SmartPLS4 was used to analyse the data. The findings indicate a positive and significant direct relationship between environmental training and green logistics management practices. However, the study finds that the involvement of supplier environmental orientation, top management commitment, and corporate environmental orientation in mediating and moderating these relationships is not statistically significant. This underscores the critical role of leadership in promoting sustainable practices within organisations. The study recommends that management should focus on other avenues for enhancing the impact of environmental training on green logistics practices, furthermore, the study recommends implementing effective environmental management strategies that closely align with the organisation's overarching environmental goals.

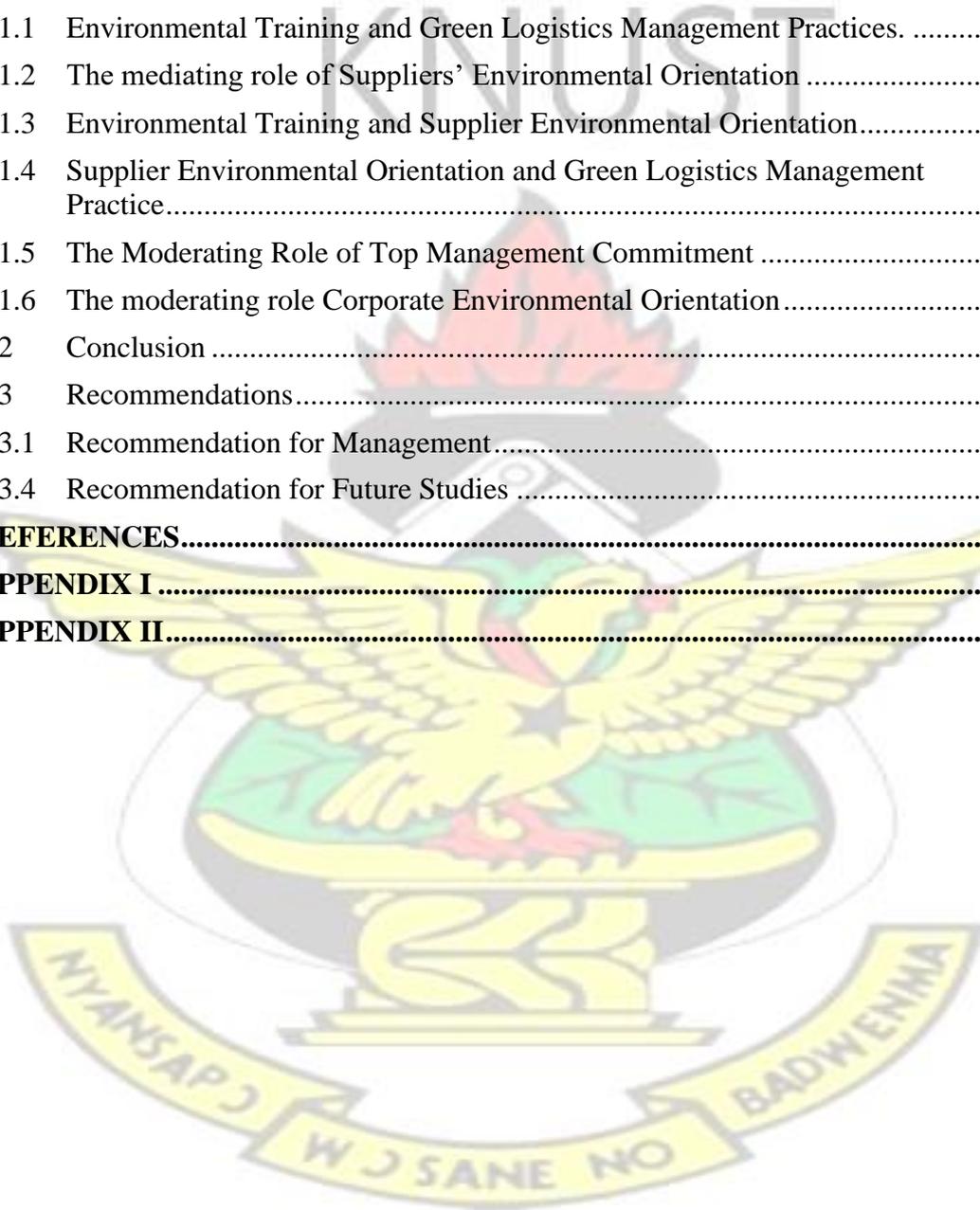
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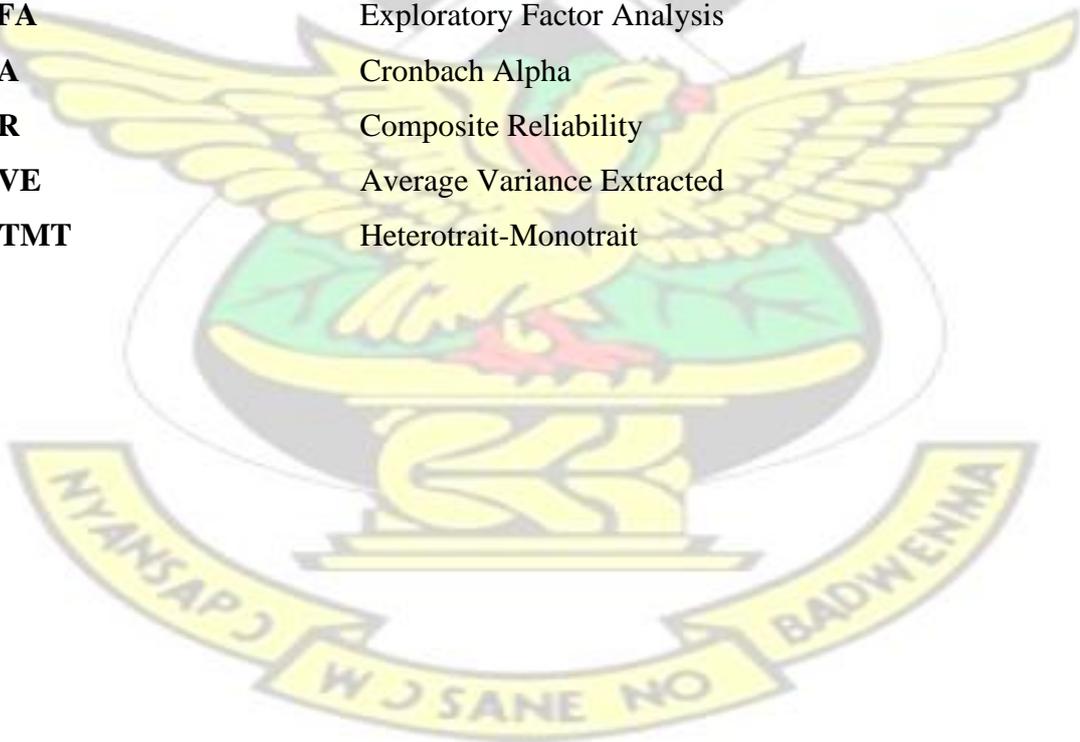
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## LIST OF ABBREVIATION

<b>GLMP</b>	Green logistics management practices
<b>GHRM</b>	Green Human Resource Management
<b>SEM</b>	Structural Equation Modeling
<b>ET</b>	Environmental Training
<b>SEO</b>	Supplier Environmental Orientation
<b>TMC</b>	Top Management Commitment
<b>CEO</b>	Corporate Environmental Orientation
<b>RBV</b>	Resource-Based View of the firm
<b>NRBV</b>	Natural Resource-Based View
<b>SMEs</b>	Small and Medium-Sized Enterprises
<b>CFA</b>	Confirmatory Factor Analysis
<b>GSS</b>	Ghana Statistical Service
<b>SD</b>	Standard Deviation
<b>CMV</b>	Common Method Variance
<b>EFA</b>	Exploratory Factor Analysis
<b>CA</b>	Cronbach Alpha
<b>CR</b>	Composite Reliability
<b>AVE</b>	Average Variance Extracted
<b>HTMT</b>	Heterotrait-Monotrait



# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

Activities and operations performed by many industrial organisations have resulted in increased environmental pollution, global warming, greenhouse gas emissions, climate change, poor waste management, and the excessive use of the scarce natural resources, resulting in the manufacturing of items that have a negative impact on the environment (Feng et al., 2018; Khan et al., 2019). In this regard, environmentally oriented organisations are becoming more fascinated with environmental sustainability, with the hope of ameliorating the environmental vulnerabilities of their operations and eventually bringing about behavioural changes that may go a long way to promote the well-being and sustainability of the environment (Al-minhas, et al, 2020).

Many environmentally oriented organisations are turning to diverse environmentally sustainable strategies and measures to address these ever-increasing environmental challenges (Sharma et al., 2017; Pham et al., 2018; Singh et al., 2019). Because, adopting these environmentally sustainable practices and strategies into the daily operations of organisations are very crucial for improved business performance in this modern era (Ndubisi and Al-Shuridah, 2019).

Indeed, organisations can improve their performance in terms of environmental sustainability when there is a total transformation of organisational management practices and systems, through the adoption of green management practices including environmental awareness creation and sensitization (Ballantyne et al., 2011; Sharma et al., 2017; Yadlapalli et al., 2018; Chi et al., 2021), green human resource development (Pham et al., 2020; Donmez-turan and Erdem, 2021); water and energy conservation (Becken and Dolnicar, 2016); green certification and eco-labels (Sharma et al., 2017); and green logistics management (Luthra and Mangla, 2018).

Organisations frequently employ these green management practices to ensure that their daily operations adhere to sustainability principles (Yafi et al., 2021). Because, these green practices can help guarantee societal safety, minimise the environmental effects, increase efficiency, and gain a competitive edge (Agyabeng-Mensah et al., 2020a). In other words, organisations adopt these sustainability-oriented practices to safeguard the

health and well-being of employees as well as the needs of other stakeholders by reducing greenhouse gases emission, waste, and resource and energy consumption edge (Longoni et al., 2016; Zaid et al., 2018).

One of the most important corporate environmental strategies with significant potential for effectively implementing environmental sustainability practices within the organisation is environmental training (Aragão and Jabbour, 2017). Environmental training is seen as a strategy for improving employees' capacity for problem-solving and coordinate business operations with environmental protection measures to meet organisational sustainability objectives (Amrutha and Geetha, 2021). Also, it is employed to highlight an organisation's environmental initiatives and efforts to improve its corporate legitimacy and reputation (Hunter and Bansal, 2007; Maas et al., 2014). According to Singh et al. (2019), environmental training is essential in an organisation's efforts to minimise pollution, enhance corporate environmental management objectives to increase the quality of its products and services, lower overall operational costs, and also impact competitive advantage.

The literature on environmental training has highlighted a variety of outcomes for the successful implementation of environmental training programmes, including, (i) environmental training helps to raise top management and employees' awareness of how their daily operations and the decision could impact the environment (Daily et al., 2012), (ii) employees with environmental training can identify environmental problems (Jabbour, 2013), (iii) environmental training equips top management and employees to carry out their environmental obligations and help achieve the firm's environmental management objectives. (Pham et al., 2020), (iv) employees who receive environmental training are more prepared to realize green objectives through the adoption of green knowledge, green abilities, and green experience. (v) Additionally, environmental training improves knowledge of environmental management and organisational green principles (Pinzone et al., 2019).

Although environmental training is crucial for improving environmental capabilities and competencies (Teixeira et al., 2016), the successful implementation of environmentally friendly management practices requires the critical support and commitment of top management (Luthra and Mangla, 2018; Ren et al., 2018). Colwel and Joshi (2013) argue that, when the firm's top management is genuinely committed,

it is more likely that environmentally responsible procedures will be adopted since top management in the organisation drives the transformation agenda to fully realize the potential of green management practices (Diabat and Govindan, 2011; Tarigan, 2021). Thus, for an organisation to successfully embrace green management practices, there must be a considerable top-level management commitment to ensure that the benefits of its implementation result in a competitive advantage (Spencer et al., 2013).

According to Jabbour and de Sousa-Jabbour (2016), top managers need to take into account the sustainability of their logistics activities in their daily operations to minimise environmental damage and ensure the safety of society. As a result, environmentally oriented organisations have started implementing green practices in their logistics management operations (Yang et al., 2019).

Green logistics management practices (GLMPs) refer to environmentally-friendly strategies adopted in logistics management that involve sustainable logistics activities, such as the recycling and proper disposal of waste, sustainable transportation, warehousing, and distribution (Baah et al., 2020).

Additionally, implementing green logistics management practices in an organisation requires the commitment of external parties beyond the organisation's control, such as suppliers and customers, to ensure environmental sustainability (Zhou et al., 2020). For the implementation of green logistics management practices within an organisation, it is crucial to have the support and commitment of external stakeholders, especially suppliers, who play a vital role in ensuring environmentally friendly logistics operations. Environmentally conscious suppliers are required to use eco-friendly raw materials, minimise hazardous waste and reduce energy consumption during production to promote sustainable logistics practices (Siagian et al., 2022). This is because, any environmental issue that arises as a result of the logistics operations not only jeopardizes the performance of the focal organisation but also may have a substantial impact on the whole supply chain (Kong et al., 2021).

Organisations that are environmentally aware place great importance on identifying suppliers who share similar environmental values since these suppliers provide crucial materials and information necessary for the successful implementation of environmental sustainability practices (Zhou et al., 2020). The supplier's environmental orientation is viewed as a critical capability for the organisation to successfully

implement environmental management practices and strategies within the organisation (Yadlapalli et al., 2018). Hence, implementing green logistics management strategies requires working with suppliers to guarantee that all requirements for raw materials or components adhere to the environmental sustainability guidelines (Tarigan, 2021).

However, despite the significance of these corporate environment management practices, several critical questions remain unanswered regarding the effectiveness and underlying mechanisms of these environmental management strategies in promoting suppliers' environmental orientation and adoption of green logistics management practices. Therefore, this research aims to investigate the impact of environmental training on suppliers' environmental orientation and green logistics management practices, building upon the premise that, understanding these relationships is essential for advancing sustainable supply chain practices (Singh et al., 2019).

## **1.2 Problem Statement**

The logistics department of the organisation performs a critical activity in the supply chain of organisations both locally and globally (Santos, 2000). Hence, poor logistics operations management may result in increased energy and waste consumption as well as greenhouse gas emissions, which could endanger the sustainability of the environment and society (Agyabeng-Mensah et al., 2020). Adopting green logistics management practices (GLMPs) is viewed in this context as a precautionary step to mitigate the adverse effects that logistics activities have on the environment (Evangelista et al., 2017).

The purpose of adopting green logistics management practices is to introduce environmentally friendly policies and practices into the logistics operations of organisations and as well increase awareness among relevant stakeholders to conserve energy and resources (Al-minhas et al., 2020; Kumar, 2022). According to Macharis and Kin (2017), one of the best strategies to increase environmental sustainability through green logistics management practices is to raise key stakeholders' awareness and participation.

The realisation of the need to increase the awareness and participation of key stakeholders within the organisation to develop drastic measures and strategies to address the ever-increasing environmental challenges caused by logistics operations

continues to gain considerable attention in both academia and practice (Zaid et al., 2018; Navarro et al., 2018; Zowada 2018; Cao and Chen 2019). While various strategies and measures to increase environmental awareness have been discussed in existing literature (Ballantyne et al., 2011; Sharma et al., 2017; Yadlapalli et al., 2018), other important approaches appear to have escaped the attention of logistics and supply chain research. One crucial approach that has been overlooked by logistics and supply chain researchers is environmental training, which is considered to be one of the several GHRM practices that help establish environmental management practices, create an environmental culture, and train employees to be environmentally conscious and capable of detecting and minimizing waste (Aragão and Jabbour, 2017).

Many research studies have focused on the concept of environmental training, and as a result, new knowledge on environmental training and corporate environmental management practice has been developed (Hirunyawipada and Xiong 2018; Navarro et al., 2018; Pinzone et al., 2019; Amrutha and Geetha, 2021; Chan and Ma, 2021). There is no prior research demonstrating the relationship between environmental training and its effects on green logistics practices. This lack of insight could limit the appropriate conceptualisation of the processes and outcomes of these environmental management practices and consequently, constrain relevant managerial and corporate decisions and actions. This suggests the need to address the lack of research on the impact of environmental training on green logistics management practices and to build upon the existing efforts of prior researchers in this area.

Moreover, several studies have shown that environmental awareness has various impacts on the environmental performance of firms, as evidenced by the works of Zhou et al. (2020); Andersén et al. (2020), and Chan and Ma (2021). However, many of these scholars focused on the internal stakeholders' perspective of environmental orientation and its impact on corporate environmental performance (Aboelmaged, 2018; Bu et al., 2020; Zhou et al., 2020; Qiao et al., 2022) without considering external stakeholders such as suppliers. To address this research gap, this study examines the mediating role of suppliers' environmental orientation in the relationship between environmental training and green logistics management practices.

This study seeks to examine the environmental management practices in a developing country by investigating how environmental training is related to the implementation of green logistics management practices. Several studies on green logistics management practices (GLMPs) have been conducted in other parts of the world (Agyabeng-Mensah et al., 2020). However, research on green logistics management in developing economies such as Africa, has not gotten enough attention from academia (Tseng et al., 2019). This limitation hinders a comprehensive understanding of how organisations in these developing countries strategically address environmental issues, thereby restricting the depth of insights into the unique challenges, approaches, and outcomes associated with environmental management practices in these regions."

### **1.3 Research Objectives**

In general, the main objective of this research study is to explore the relationship between environmental training and green logistics management practices. This relationship will be examined by considering the mediating role of suppliers' environmental orientation, as well as the potential moderating effects of top management commitment and corporate environmental orientation. The specific objectives are;

1. To examine the relationship between environmental training and green logistics management practices and environmental training and supplier environmental orientation.
2. To examine the relationship between supplier environmental orientation and green logistics management practices
3. To examine the mediating role of supplier environmental orientation in the relationship between environmental training and green logistics management practices.
4. To investigate the moderating effect of top management commitment on the relationship between environmental training and supplier environmental orientation.
5. To examine how corporate environmental orientation moderates the relationship between environmental training and green logistics management practices.

## **1.4 Research Questions**

To conduct the research effectively, the following set of research questions has been formulated as a framework to collect relevant data that will serve as a basis for the study's conclusions.

1. What is the relationship between environmental training and green logistics management practices and environmental training and supplier environmental orientation?
2. What is the relationship between supplier environmental orientation and green logistics management practices?
3. Does supplier environmental orientation mediate the relationship between environmental training and green logistics management practices?
4. Does top management commitment moderate the relationship between environmental training and supplier environmental orientation?
5. Does corporate environmental orientation moderate the relationship between environmental training and green logistics management practice?

## **1.5 Justification of the Study**

In this modern era, managing logistics operations is growing more and more difficult due to the sustainability of the environment, which is a concern for many industrial organisations (Ndubisi and Al-Shuridah, 2019). Particular emphasis is placed on how to promote environmental awareness within the organisation's operations and implement environmental practices in the logistics activities of their supply chains (Chandrakar and Kumar, 2012).

The study addresses a significant gap in the existing literature by investigating the relationship between environmental training, a critical aspect of Green Human Resource Management (GHRM), and Green Logistics Management Practices (GLMP). As there is limited prior research on this specific relationship, the study aims to fill this gap and contribute new knowledge to the field.

Additionally, the research seeks to provide empirical evidence on the adoption of environmentally sustainable management practices in the industrial sector of Ghana, where logistics activities have the potential to harm the environment (Agyabeng-Mensah et al., 2020). By offering real-time data and insights, the study enhances the

understanding of the practical implications of environmental training and its impact on green logistics management. Therefore this study may contribute to mitigating the environmental impact of logistics activities in Ghana and similar regions, thus supporting sustainable development goals.

Furthermore, practically the study's focus on environmental training and green logistics management practices addresses an important issue faced by industries worldwide. Understanding how these practices can positively influence logistics operations is essential for businesses seeking to improve their environmental performance and align their operations with sustainability goals.

Similarly, the research makes a significant contribution to the existing body of knowledge by exploring the relationship between corporate environmental management strategies, environmental training, and green logistics management. The findings have the potential to inform and enrich future academic discussions and research in this area.

Finally, the research findings are expected to be useful to various stakeholders, including researchers, academics, students, policymakers, logistics and supply chain experts, and other professionals interested in sustainable practices. The study's insights can inform decision-making and policy formulation, ultimately fostering more environmentally responsible approaches in the industrial sector.

### **1.6 Research Methodology**

The primary objective of this research is to investigate the impact of environmental training on the green logistics management practices of industrial organisations. To achieve this objective, a quantitative survey methodology was employed as the research design. A survey study refers to a means of collecting data by posing a set of written or verbal questions to participants to obtain information. This method is commonly used in research and has been described in literature by authors such as Punch (2005) and Saunders et al. (2009). The focus of this study was on top-level management executives, such as CEOs and Managing Directors, and key personnel in managerial positions, including supply chain managers, procurement or purchasing managers, logistics or transport managers, and operations managers. These individuals were selected as the target population for this research. For this study, a total of 300 firms in Ghana were sampled from a database of 1,179 businesses in Ghana, which was compiled by the

Ghana Revenue Authority and contained accurate and current information such as industry, address, and phone numbers. To select the sample for the study, the researcher employed a stratified sampling technique, where the organisations were categorized based on their subsectors of operation, and a sample was selected from each category. The researcher employed a proportional type of stratified sampling technique to select respondents from each of the different subsectors within the industries. During the data collection process, one respondent per firm was contacted. The selected respondents were CEOs, Managing Directors, and other managers such as operations managers, logistics or transport managers, procurement or purchasing managers, and supply chain managers. These individuals were chosen because they were deemed fit to provide relevant information about the logistics and supply chain management practices of their organisations. The main data collection instrument employed in this study was a survey questionnaire designed in a Likert scale format. The study utilised the approach of structural equation modeling (SEM) to assess the models, confirm their validity, and examine the hypotheses. The SPSS software, version 25 and SmartPLS4 aided the analysis of data

### **1.7 Scope of the Study**

The main scope of this study is to investigate the implementation and impact of green logistics management practices (GLMPs) in specific industries in Ghana. The study focuses on four industries: manufacturing, agriculture or agribusiness, mining or extraction, and logistics/transportation organisations. These industries were selected based on their significant impact on environmental pollution, high energy consumption, and waste disposal, which can lead to environmental destabilization and harm public health (Agyabeng-Mensah et al., 2020).

The research aims to understand the current state of GLMPs within these industries and explore the challenges and opportunities they face in adopting and implementing sustainable logistics practices. Additionally, the study specifically focuses on the industrial sector in Ghana due to the lack of sufficient research on GLMPs in developing economies like Africa. By concentrating on Ghana, the research seeks to contribute to the understanding of how organisations in developing countries address environmental issues and promote sustainable logistics practices.

The findings of this study have the potential to enhance both theoretical and practical comprehension of environmental management practices within these organisations. By shedding light on the current status of GLMPs and offering insights into effective strategies for environmental management, the study's results can inform policymakers and industry stakeholders, contributing to the advancement of sustainable practices in the industrial sector in Ghana.

### **1.8 Limitations of the Study**

Indeed, limitations are common in any research study, and this study is no exception. It is essential to acknowledge these limitations to provide a balanced view of the research findings.

Firstly, the study's sample was limited to firms in Ghana, which could potentially restrict the generalisability of the results beyond this geographical area. Different countries or regions may have unique contextual factors that could influence the adoption of green logistics management practices. Therefore, caution should be exercised when attempting to apply the study's findings to other settings.

Secondly, the use of a single respondent from each firm may lead to some limitations in terms of data accuracy and objectivity. While this approach is common in quantitative research design, relying on a single respondent may lead to bias, as individuals may have different perspectives or may exaggerate the firm's actual environmental practices and commitment to environmental sustainability. Using multiple respondents from each organisation could have provided a more comprehensive and diverse perspective.

Thirdly, this study used cross-sectional data, which provides a snapshot of information at a specific point in time. While cross-sectional data are frequently used in previous research, they may not capture the dynamics and changes that occur over time in organisations' environmental practices. Longitudinal data could offer a more comprehensive understanding of the relationships between environmental training and green logistics management practices.

Finally, the research faced constraints related to financial costs and a limited time frame for completion. These limitations may have impacted the scope of the study, the depth of data collection, and the range of variables examined.

### **1.9 Organisation of the Study**

The study is structured into five chapters. Chapter one contains the introduction, problem statement, objectives of the study, research questions, justification, research methodology, scope, limitations, and organisation of the study. Chapter two is the literature review, which discusses the definition of the key concepts and variables, empirical studies, and theoretical frameworks, as well as hypothesis development. Chapter three outlines the research methodology, including the research philosophy, design, population and sampling techniques, research instruments, data collection method, and data analysis techniques. Chapter four presents the results of the study and the analysis of the findings, with a discussion of the results. Finally, chapter five provides the conclusions and recommendations based on the research findings.



## CHAPTER TWO

### LITERATURE REVIEW

#### **2.0 Introduction**

The purpose of this chapter is to perform a comprehensive review of the literature on environmental training, supplier environmental orientation, green logistics management practices, top management commitment, and corporate environmental orientation to establish a theoretical and empirical foundation for the research phenomenon. The study's multidisciplinary and integrative nature is addressed by exploring and developing key research components that can address the underlying issues in the research questions. The first section of the chapter presents definitions for important concepts used in the study, including environmental training, green logistics management practices, supplier environmental orientation, top management commitment, and corporate environmental orientation. The second section examines relevant theoretical literature related to the research topic, the third section examines the relevant empirical literature and finally, the fourth section presents the conceptual frameworks and hypotheses development.

#### **2.1 Conceptual Review**

In this section of the study, the definitions of various concepts such as Environmental Training (ET), Supplier Environmental Orientation (SEO), Green Logistics Management Practices (GLMPs), Top Management Commitment, and Corporate Environmental Orientation are presented. The definitions provided by different scholars are reviewed, and the definition used in this study is ultimately determined.

##### **2.1.1 The Concept of Environmental Training (ET)**

The concept of "Environmental Training" also known in literature as "Green Training" (GT) has no universally agreed-upon definition (Pham et al., 2020; Al-minhas et al., 2020). Thus, the concept has been defined by many scholars from different viewpoints (Jabbour, 2015; Al-minhas et al., 2020; Pham et al., 2020). The term "Environmental Training" (ET) refers to an idea of environmental sustainability practices that endeavour to improve staff members' skills, enthusiasm, and commitment to organisations' environmental goals (Singh *et al.*, 2019). According to Aragão and Jabbour (2017), environmental training is a key component of GHRM that help build

environmental management practices, an environmental culture, and well-trained staff members that are environmentally conscious and can detect and minimise waste. Additionally, it is viewed as a tool for enhancing employees' capacity for problem-solving to generate answers to address environmental issues and bring into light corporate policies relating to environmental preservation strategies to achieve organisational sustainability objectives (Amrutha and Geetha, 2021). According to Moradeke et al. (2021), environmental training is defined as the procedure of delivering environmental education, fostering staff consciousness, and integrating environmental sustainability objectives and goals into the overall agenda of an organisation.

Renwick et al. (2013) defined environmental training as a human resource development activity that aims to provide employees with the necessary knowledge and skills to understand environmental challenges and protect the environment. Paillé et al. (2014) defined environmental training as a type of training that focuses on current environmental challenges and helps all employees, including top, senior, and middle managers, to integrate environmental considerations into the company's operations. According to Jabbour (2015), environmental training can be considered an organisational practice within the context of human resource management that aims to align HR practices with the environmental goals of the organisation. Pinzone et al. (2019) described environmental training as an approach to on-the-job learning that aims to achieve corporate environmental management objectives. Pham et al. (2020) supplemented this definition by noting that environmental training involves providing systematic opportunities and knowledge to enable employees to acquire the required environmental knowledge, behaviours, and attitudes.

Xie et al. (2020) argued that environmental training (ET) is necessary for both organisations and employees to ensure sustainable development. ET is a form of ongoing training that aims to enhance employees' knowledge and skills. Tang et al. (2018) supported this argument by highlighting that environmental training programs contribute to the development of employees' emotional attachment, green knowledge, attitudes, and awareness, as well as their environmental consciousness and ability to cultivate an environmental orientation for the organisation and its stakeholders.

The definitions of environmental training discussed in this section share a common objective of increasing the environmental awareness of organisations and their employees concerning the environmental challenges they face in their operations. Essentially, companies that are environmentally conscious operate with sustainability principles and employ mindful strategies to efficiently manage their resources, which promotes the well-being of their staff and stakeholders (Ndubisi and Al-Shuridah, 2019).

### **2.1.2 Green Logistics Management Practices (GLMPS)**

Various scholars have provided different definitions of green logistics management practices (GLMP) in the literature, indicating that it involves the development and evolution of conventional logistics processes with a focus on environmental sustainability, which emphasises undertaking logistics operations in an environmentally responsible way to fulfill the development of logistics operations while protecting the environment and preserving resources (Zhang et al., 2020). Yang et al. (2019) explain that green logistics management is an eco-friendly logistics system that encompasses reverse logistics activities including waste recycling and disposal, as well as logistical operations like transportation, warehousing, and distribution.

According to Bajec and Tuljak-suban (2016), green logistics is the delivery of traditional or forward logistics services that are directed from the manufacturer to the final customer using environmentally friendly practices. It includes reusable packaging, recycling, remanufacturing, air and noise emission reduction, the environmental effects of mode selection, how to measure the environmental impact and energy conservation. Unlike traditional logistics, green logistics is more focused on sustainability and reducing environmental harm than it is on cost (Blanco and Sheffi, 2017). The optimisation of logistics flows and enhancing a company's reputation are two advantages of implementing green logistics, (Carbone and Moatti, 2008). Zowada (2018) characterizes GLMPs as a paradigm of material flow management that integrates information flow from the very start of the organisation and helps the company accomplish its stated economic and ecological goals.

Kumar (2015) describes green logistics as the manufacturing and delivery of products in a way that is both socially and environmentally responsible. According to Arslan and Sevgi (2017), green logistics is defined as the design and execution of logistics operations to reduce their adverse environmental consequences, whilst Kwak et al. (2020) define green logistics as the type of logistics operations that actively considers its effects on both the transport and environmental sectors. Jefimovaitė (2021) argues that green logistics as an ecologically friendly system that implements preliminary logistics activities encompassing the acquisition of raw resources, manufacturing, packaging, and distributing of products as well as reverse logistics procedures such as packaging recycling. According to Al-minhas et al. (2020), GLMPs involve making logistics operations more environmentally friendly, which includes activities related to transportation, warehousing, and packaging.

The objective of GLMPs is to improve a company's efficiency by integrating eco-friendly principles and approaches into its logistics processes, resulting in the preservation of resources and energy and the reduction of adverse effects on the environment and society (Agyabeng-Mensah et al., 2020a).

Given the above, Green Logistics Management Practices (GLMPs) can be seen as a set of strategies and principles aimed at incorporating environmentally friendly practices into traditional logistics operations (Zhang et al., 2020; Bajec and Tuljak-suban, 2016). Thus GLMPs emphasizes on reducing the environmental impact of logistics processes, which may involve various measures such as waste reduction, recycling, energy conservation, eco-friendly transportation, sustainable packaging, and reverse logistics activities like product recycling and disposal (Yang et al., 2019).

The main goal of GLMPs is to achieve a balance between fulfilling logistics operations and protecting the environment (Kumar, 2015). These practices prioritise sustainability and social responsibility over purely economic considerations, aiming to minimise resource consumption, greenhouse gas emissions, and other negative environmental and societal effects associated with logistics activities (Al-minhas et al., 2020).

Through the adoption of GLMPs, companies can enhance their reputation, improve operational efficiency, and contribute to the overall sustainability of their supply chains. By aligning their logistics practices with environmentally responsible approaches,

organisations can play a role in preserving resources, mitigating climate change, and promoting a more ecologically friendly future (Agyabeng-Mensah et al., 2020b).

### **2.1.3 Supplier Environmental Orientation**

Purchasing organisations face a significant strategic challenge in extending environmental management principles and practices to include entities in the upstream supply chain (Hajmohammad and Vachon, 2016). As customers and other stakeholders do not usually distinguish between supply chain actors concerning environmentally hazardous behaviour, buying organisations are often blamed for all supply chain activities (Qiao et al., 2022). Therefore, the supplier's environmental orientation and commitment play a crucial role in creating environmentally sustainable supply chains for the buying organisations.

Supplier Environmental Orientation (SEO) refers to the degree of environmental commitment or awareness of a supplier, as well as their willingness to adopt environmentally sustainable practices to meet the environmental requirements of their customers (i.e., buying organisations). It involves the supplier's understanding of its environmental responsibilities and the implementation of environmentally friendly procedures and practices in its operations, such as reducing carbon emissions, using eco-friendly materials, and recycling waste. The ultimate goal of SEO is to create an environmentally sustainable supply chain by engaging suppliers in environmentally responsible practices (Awan et al., 2018).

The concept of supplier environmental orientation is closely linked to the idea of supply chain sustainability, which recognises that a company's environmental performance is affected by the actions of its suppliers (Sarkis and Zhu, 2018). This idea is in line with Seuring and Müller's (2008) perspective, which claims that supply chain management may be seen as a tool for implementing sustainability and that environmental concerns have taken on significant importance in supply chain management. An organisation must therefore extend its environmental focus to its suppliers to be truly environmentally sustainable.

All the definitions of supplier environmental orientation share a common understanding that it refers to the supplier's dedication and obligation to implementing environmentally sustainable practices and reducing the negative impact of their

activities on the environment. At the same time, suppliers also recognise the environmental requirements of their customers and other stakeholders. It entails putting environmental management systems into place, making investments in pollution prevention and control, acquiring environmental certifications, and overseeing sustainable supply chain practices.

Hong et al. (2009) definition of supplier environmental orientation emphasizes the long-term commitment of the supplier to develop environmentally conscious products and services through the implementation of environmental enhancement initiatives and programs. Furthermore, SEO is seen as an inter-organisational activity that aims to achieve challenging performance outcomes through successful product design, supply chain integration, and improved business processes.

The goal of supplier environmental orientation (SEO) is to improve businesses' observable benefits via the adoption of cutting-edge environmental measures (Hong, et al., 2009). This implies that suppliers who prioritise environmental sustainability are more inclined to enhance the production of new and existing products and augment their environmental knowledge. By doing so, they contribute to the overall environmental performance of the buying organisation and the entire supply chain while preserving their reputation (Qiao et al., 2022).

#### **2.1.4 Top Management Commitment (TMC)**

According to Siagian et al. (2022), the concept of "top management commitment" (TMC) refers to how top management supports and participates in the business strategy and operations. The capacity to develop personnel and give appropriate training, the willingness to work toward success, the supply of resources when necessary, and continuous system review are all examples of top management commitment (Tarigan, 2021). To achieve the objectives and vision of the organisation, top management commitment involves creating a collaborative work environment that fosters motivation and cooperation among employees (Cao and Chen, 2019).

According to Fernando et al. (2019), top management commitment refers to senior executives and leaders actively supporting and promoting the organisation's goals, strategies, and values, including environmental sustainability. This commitment is essential to ensuring that the organisation as a whole is in line with these objectives and

takes effective steps to meet them. Top management is defined as an individual or group of individuals with the capacity to motivate staff members to achieve a company's mission and objectives (Mandal, 2020). In addition, top managers' commitment to strengthening an organisation's skills is referred to as top management commitment (Gavronski et al., 2011). Sandberg and Abrahamsson (2010) describe top management commitment as a process that typically involves communication and coordination among different functions to reorganise their roles and responsibilities to achieve the organisation's goals and objectives. Similarly, Haldorai et al. (2022) define top management commitment as the degree to which senior members of a company are perceived as champions of environmental sustainability.

Top management commitment (TMC) holds significant importance in organisational success and is particularly crucial in the context of environmental sustainability. Top management commitment signifies the active support and participation of senior executives in driving the business' strategy and operations (Siagian et al., 2022). This commitment involves providing appropriate training, allocating resources when necessary, and continuously reviewing systems to ensure alignment with organisational goals (Tarigan, 2021).

In the pursuit of achieving the organisation's objectives and vision, top management commitment plays a vital role in fostering a collaborative work environment that motivates and encourages cooperation among employees (Cao and Chen, 2019). It ensures that the entire organisation is aligned with its goals, values, and strategies, including environmental sustainability (Fernando et al., 2019). Top managers have the capacity to inspire and motivate staff members to achieve the company's mission, making their commitment pivotal in driving sustainability initiatives (Mandal, 2020).

For an organisation to succeed in its sustainability endeavours, top management commitment goes beyond just verbal support; it involves actively championing and advocating for environmentally responsible practices (Gavronski et al., 2011). This commitment entails communication and coordination among different functions within the organisation to reorganize roles and responsibilities, further aligning efforts towards achieving environmental sustainability goals (Sandberg and Abrahamsson, 2010). Moreover, the perception of top management as champions of environmental

sustainability are essential in inspiring others and fostering a culture of sustainability within the organisation (Haldorai et al., 2022).

In summary, top management commitment is a fundamental element in driving organisational efforts toward environmental sustainability. It involves active support, coordination, and collaboration among top executives to ensure that the organisation as a whole is dedicated to achieving its environmental objectives. This commitment plays a crucial role in motivating employees and fostering a sustainable organisational culture, ultimately leading to successful and impactful environmental sustainability initiatives

### **2.1.5 Corporate Environmental Orientation**

Corporate Environmental Orientation is the amount of high-ranking management's dedication, commitment, and leadership in protecting the natural environment for the business and implementing corporate environmental standards (Tanuwijaya et al., 2021). Another dimension of Corporate Environmental Orientation is given by Li et al. (2020) as a reflection of a company's capacity to incorporate environmental considerations into routine management and operations. On the other hand,

Hirunyawipada and Xiong (2018) defined corporate environmental orientation as the extent to which an organisation incorporates ecological concerns into its business strategy in order to mitigate the negative impact on the environment. On the other hand, Li *et al.* (2017) define corporate environmental orientation as an organisation's commitment to acting ethically to protect and improve the environment, as well as its strategy for doing so.

According to Dixon-Fowler et al. (2017) Corporate environmental orientation "measures how successful a corporation is in reducing and limiting its impact on the environment. Ludwig and Sassen (2022) explain that corporate environment orientation is the commitment to the implementation of responsible activities aimed at environmental conservation and improvement while attaining economic performance.

Corporate Environmental Orientation (CEO) is a comprehensive concept that encompasses an organisation's commitment, dedication, and leadership in protecting the natural environment and implementing environmental standards (Tanuwijaya et al.,

2021). It involves integrating environmental considerations into routine management and operations (Li et al., 2020), and strategically incorporating ecological concerns into the business strategy to mitigate negative environmental impacts (Hirunyawipada and Xiong, 2018).

The commitment to act ethically for environmental protection and improvement is an essential aspect of corporate environmental orientation (Li et al., 2017). Successful implementation of responsible activities aimed at environmental conservation and improvement while maintaining economic performance is also a fundamental aspect of corporate environmental orientation (Ludwig and Sassen, 2022).

In summary, corporate environmental orientation encompasses a range of dimensions, including high-level management commitment to environmental protection and standards, integration of environmental considerations into daily operations, mitigation of negative environmental impacts through strategic planning, and a commitment to ethical environmental practices. Additionally, CEO involves the development and implementation of strategies to protect and improve the environment, and the successful reduction of a corporation's overall environmental impact.

Organisations that embrace corporate environmental orientation play a critical role in driving environmental sustainability. By proactively incorporating ecological concerns into their operations and making ethical decisions that prioritize environmental protection, these corporations contribute to a positive impact on the environment while maintaining their economic performance.

## **2.2 Theoretical Review**

By examining the impact of environmental training on supplier environmental orientation and the adoption of green logistics management practices. This research substantially broadens the application of the natural resource base view theory and upper echelons theory, by providing a comprehensive examination and analysis of existing academic and scholarly works that pertain to these theories.

### **2.2.1 Natural Resource Base View**

The resource-based view of the firm (RBV) was introduced by Wernerfelt (1989). It proposes that a firm's resources and capabilities contribute to its competitive advantage. This perspective has gained significant traction in diverse settings, such as supply chain contexts, as evidenced by Hult et al. (2006). Building upon the RBV, (Hart, 1995; Hart and Dowell, 2011) further developed the concept into the Natural Resource-Based View (NRBV). The NRBV underscores how firms attain competitive advantage through their resources tied to sustainable development, pollution prevention, and product stewardship (Hart, 1995).

The concept of the natural resource-based view (NRBV) presents a theoretical framework that centres on the strategic consequences stemming from a company's management and control over valuable and distinctive natural resources (Barney, 1991). This theory suggests that these resources have the potential to serve as a lasting wellspring of competitive advantage for an organisation, given their frequent scarcity, difficult replicability, and non-substitutability (Barney, 1991; Wernerfelt, 1984).

Barney (1991) contend that firms have the potential to attain competitive advantage through the strategic utilisation of their distinct natural resources to generate value for both customers and stakeholders. This perspective implies that the possession of valuable natural resources equips a firm with the capacity to set its products or services apart from those of competitors, thereby facilitating differentiation.

Research on the natural resource-based view (NRBV) has emphasized that a firm's engagement with its natural environment through sustainable development, pollution prevention, and product stewardship constitutes a foundation of competitive advantage (Hart, 1995). Consequently, firms are advised to direct their attention toward resources and capabilities that facilitate such interaction. For instance, the elimination of pollutants and waste prevention can lead to cost reduction and heightened efficiency across the entirety of the firm's value chain (Aboelmaged, 2018b).

Zahra and George (2002) elaborated on the NRBV by introducing the notion of dynamic capabilities, which pertain to a firm's capacity to adjust, incorporate, and restructure its resources in reaction to evolving market dynamics. This concept widens the NRBV's emphasis from static resource advantages to the dynamic mechanism of overseeing and revitalising resources over the course of time.

The natural resource-based view (NRBV) has captured the interest of researchers across diverse fields. For instance, drawing from the NRBV theory, Menguc and Ozanne (2005) discovered a positive impact of a firm's natural environmental orientation on both profitability and market share among Australian manufacturing firms.

Fraj et al. (2013) employed the NRBV framework to examine the effects of green marketing strategies on B2B performance. Their research verified the significant impact of managerial decisions in formulating and implementing green marketing strategies by infusing environmental values into the organisation's culture. In a recent study, De Stefano et al. (2016) adopted the NRBV approach to categorize technological innovations and authenticate their contribution to the reduction of CO2 emissions from vehicles. Similarly, Miemczyk et al. (2016) employed the NRBV perspective to explain the essential role of technology and knowledge in facilitating successful strategic changes within the supply chain.

Moreover, the NRBV framework has found application within the context of small and medium-sized enterprises (SMEs). Aragon-Correa et al. (2008) discovered that Spanish SMEs exhibited organisational capabilities encompassing strategic proactivity, stakeholder management, and shared vision, which are associated with environmental leadership, pollution prevention, and adherence to regulations. These factors, in turn, contribute to improved financial performance. Similarly, Aragon-Correa and Matias-Reche (2010) leveraged the NRBV framework to delineate the strengths and limitations of SMEs when confronting environmental challenges at micro and macro levels. In a recent study, Woo et al. (2014) employed the NRBV perspective to investigate how environmental innovation influences labour productivity among Korean SME manufacturers. These instances underscore the core tenet of the NRBV, highlighting the strategic significance of distinct and valuable resources.

However, criticisms of the NRBV have also been raised. Some scholars argue that the NRBV does not fully account for the role of human capital and organisational capabilities (Kraaijenbrink et al., 2010). They contend that while natural resources are important, a firm's ability to effectively manage and leverage these resources relies on the skills, knowledge, and routines of its employees.

Based on the theoretical background provided above, the relationship between environmental training, supplier environmental orientation, and green logistics management practices can be understood as follows:

The natural resource-based view (NRBV) posits that a firm's competitive advantage can be derived from its unique resources and capabilities, including those related to its interaction with the environment. Environmental training is considered a mechanism through which organisations acquire essential environmental skills and knowledge, allowing them to effectively manage their natural resources and engage in sustainable practices. This aligns with the NRBV's focus on leveraging valuable resources to attain a competitive edge.

Environmental training has been recognised as a means to equip organisations with the tools necessary for promoting green practices. As Aragon-Correa et al. (2008) indicated, organisations can enhance their environmental leadership, pollution prevention, and regulatory compliance capabilities through the cultivation of skills and practices facilitated by environmental training. This notion reinforces the NRBV's perspective that valuable resources, in this case, knowledge and skills gained through training, contribute to a firm's competitive advantage.

Furthermore, the concept of dynamic capabilities introduced by Zahra and George (2002) supports the idea that environmental training plays a crucial role in enabling firms to adapt to changing market conditions. Green logistics management practices, such as efficient waste management and sustainable transportation, align with the dynamic aspect of the NRBV by requiring ongoing adjustments and improvements based on evolving environmental standards and customer demands. Environmental training empowers organisations to proactively integrate these practices into their operations, enhancing their responsiveness and agility in the face of environmental challenges.

The studies conducted by Fraj et al. (2013), De Stefano et al. (2016), and Woo et al. (2014) illustrate the diverse applications of the NRBV framework in understanding the relationship between environmental factors, organisational capabilities, and competitive advantage. These studies demonstrate how environmental orientation, green marketing strategies, technological innovation, and environmental innovation can

all be integrated into the NRBV framework to reveal how firms can leverage their resources and capabilities to achieve enhanced performance and competitiveness.

Hence, this study operates under the assumption that environmental training endows organisations with essential environmental proficiencies, encompassing practices like green logistics management. These proficiencies, in turn, can establish the foundation for securing a competitive edge for the organisation. This premise corresponds with the theoretical viewpoint of the Natural Resource-Based View (NRBV), which suggests that environmental elements influence a firm's competitive advantage (Hart, 1995).

Overall, the NRBV theory provides a strong theoretical basis for understanding the relationship between environmental training, supplier environmental orientation, and green logistics management practices. It highlights the importance of environmental resources and capabilities as a source of competitive advantage, and it emphasises the role of environmental training in developing these resources and capabilities.

In addition to the reasons, the NRBV theory is also a good fit for this study because it is a relatively flexible and adaptable framework. It can be applied to a wide range of industries and settings, and it can be used to explain how firms achieve competitive advantage in both static and dynamic environments. This is important because the topic of environmental training, supplier environmental orientation, and green logistics management practices is complex and multifaceted. It is influenced by a variety of factors, including the specific industry, the competitive landscape, and the regulatory environment. The NRBV theory provides a robust theoretical framework for understanding these complex relationships and explaining how firms can achieve competitive advantage in this context.

### **2.2.2 The Upper Echelon Theory**

The upper echelon theory is a prominent framework in the field of organisational behaviour and strategic management that examines how the characteristics, experiences, and cognitive orientations of top executives influence decision-making and organisational outcomes. Introduced by Hambrick and Mason (1984) the theory posits that the personal attributes and backgrounds of top management have a significant impact on the strategic choices and overall behaviour of an organisation.

The upper echelon theory stems from the belief that organisational decisions reflect the collective cognitive and demographic characteristics of top executives. Hambrick and Mason's (1984) seminal work proposed that executives' individual experiences, values, cognitive biases, and backgrounds shape their perception of the business environment, thereby influencing strategic choices and shaping organisational outcomes. The theory highlights the critical role of top management teams (TMTs) in shaping organisational strategies.

The role of top management extends beyond the upper echelon theory to encompass bridging external influences with internal operations. They discern external pressures and opportunities, shaping the firm's strategy using internal resources (Ma et al., 2020).

This theory underpins the comprehension of organisational innovation implementation and is intertwined with environmental and organisational stimuli affecting actions and beliefs (Wei et al., 2019). These factors shape corporate sustainability strategies (Iguchi et al., 2021), with top managers also being responsible for resource allocation to guide firm performance (Bhatia and Jakhar, 2021).

The upper echelon theory asserts that top management's values and cognitive abilities shape their perception of firm issues and strategic choices (Lin et al., 2021). Such traits significantly influence profitability and contribute to the firm's overall strategy and success (Huang et al., 2020).

Numerous empirical studies have explored the upper echelon theory across various industries and organisational contexts. For instance, research by Carpenter et al. (2004) revealed that CEO characteristics, such as tenure and functional experience, influence diversification decisions. CEOs with longer tenures are likely to be more risk-averse, leading to conservative strategies, while those with diverse functional experiences may opt for related diversification.

The upper echelon theory has been applied to understand organisational responses to environmental turbulence. Studies by Finkelstein and Hambrick (1996) examined how CEOs' cognitive complexity and their tenure influence strategic adaptation to industry disruptions. Their findings demonstrated that CEOs with higher cognitive complexity were more effective at adapting their strategies in response to external changes.

Furthermore, research by Zajac and Westphal (1994) explored the influence of executives' career experiences on firm risk-taking behaviour. Executives with prior experience in environments characterized by high uncertainty and risk were more inclined to undertake ambitious and risky strategies, while those with more stable career trajectories exhibited more conservative tendencies.

The upper echelon theory offers a compelling lens to understand how top management commitment to environmental management can be enhanced by developing and nurturing an environmental orientation, which involves creating a culture that emphasizes environmental sustainability and responsibility across all levels of the organisation.

The upper echelon theory offers a compelling lens to understand how top management commitment to environmental management can be enhanced by developing and nurturing an environmental orientation. This is because the theory suggests that top management's values and cognitive abilities shape their perception of firm issues and strategic choices. By developing and nurturing an environmental orientation, organisations can create a culture that emphasizes environmental sustainability and responsibility, which can help to shape top management's values and cognitive abilities in a way that is more supportive of environmental training, supplier environmental orientation, and green logistics management practices.

The upper echelon theory also highlights that top managers are responsible for resource allocation, which is crucial when implementing environmental initiatives. Understanding how resource allocation decisions are influenced by top management's characteristics is key in the context of environmental management and sustainability. This is particularly relevant to the topic of environmental training, supplier environmental orientation, and green logistics management practices, as these areas require significant commitment and resources from top management.

### **2.3 Empirical Literature Review**

This section of the research presents an overview of the empirical studies conducted on the different concepts in the current study. The literature review encompasses diverse industries and sectors to provide insights into the essential concepts and findings that are relevant to this study.

### **2.3.1 Environmental Training on Firms Environmental Performance**

Joshi and Dhar (2020) conducted a survey in Uttarakhand, India to investigate the impact of environmental training on green innovation in handicraft firms. They considered resource commitment as a moderating variable in this relationship. Their study aimed to determine the relationship between green training and green creativity in the handicraft industry, and whether resource commitment played a moderating role in this relationship. Their findings indicated that environmental training has a direct and indirect impact on an organisation's green creativity capacity. Green dynamic capability mediates the relationship between environmental training and green creativity, with resource commitment moderating the effect of green dynamic capability on green creativity. The authors highlight the importance of green training not only for environmental management but also for its impact within an organisation. They recommended that employees in all organisations focused on environmental sustainability should participate in green training.

It is worth noting that the study by Liu et al. (2020) focused specifically on Chinese manufacturing businesses and their approach to green procurement. The study used a moderated multiple mediation model to analyze the relationship between top management support and green procurement, with a specific emphasis on the impact of environmental training. By applying the NRBV perspective, the study likely explores how firms can leverage their environmental resources and capabilities, including top management support and environmental training, to achieve a sustainable competitive advantage through successful green procurement implementation. The study found that environmental training awareness, responsibility, and technical knowledge and skills could mediate the link between top management support and green procurement. The study also discovered that the mediating effect of environmental training of technical knowledge and skills was stronger than that of awareness and responsibility.

Yong et al. (2020) conducted a study on 112 large Malaysian manufacturing companies to examine the relationship between environmental training and sustainability. The study found that green recruitment and training had positive effects on sustainability, but none of the green selection, green performance evaluation, and green rewards had any significant impact on sustainability.

Pinzone et al. (2019) conducted a study in Italy to investigate the impact of environmental training on pro-environmental behaviour and job satisfaction in the healthcare industry. The study aimed to test the hypothesis that environmental training would positively affect employee organisational citizenship behaviours for the environment (OCBEs) and job satisfaction. The study found that employees' voluntary pro-environmental behaviour is positively associated with environmental training, and environmental training increases job satisfaction among employees. The relationship between environmental training and job satisfaction was found to be mediated by employees' perception of environmental training as a form of support from their employer, which enhances the quality of their professional experience.

Amrutha and Geetha (2021) as well conducted a study to examine the relationship between environmental training and voluntary workplace green behaviours among employees in the Indian service sector. The results of the study suggest that the positive relationship between environmental training and voluntary workplace green behaviour is partially mediated by the green supporting climate in organisations. The study also found that employee satisfaction with green initiatives has a significant impact on voluntary workplace green behaviour and improves environmental performance. The study's model shows how organisations' green practices and technologies influence employees' attitudes and behaviours towards the environment by providing a supportive green climate, which ultimately enhances EGB at work and strengthens organisational ties with stakeholders and the community. The study provides valuable insights into the importance of environmental training and the role of organisational support in promoting environmentally friendly behaviour among employees in the service sector in India.

Overall, these empirical studies collectively contribute to the understanding of the multifaceted impacts of environmental training on organizational outcomes. While the studies share commonalities in emphasising the importance of environmental training, for example, the studies by (Joshi and Dhar 2020; Liu et al., 2020; Pinzone et al., 2019; Amrutha and Geetha, 2021) all delve into mediating factors like dynamic capabilities, awareness, responsibility, technical knowledge, green supporting climate, and employee satisfaction., they also highlight the contextual variations across industries and regions. The mediating and moderating factors explored in these studies provide a nuanced perspective, emphasizing the complexity of the relationship between

environmental training and organizational outcomes. Their findings have practical implications for organisations aiming to integrate sustainable practices, suggesting that effective environmental training programs can positively influence various aspects of organisational functioning.

### **2.3.2 Environmental Training on Employee Environmental Performance**

Pham et al. (2020) aimed to investigate the impact of environmental training on employees' environmental performance. The study sought to provide valuable insights into the role of environmental training in fostering eco-friendly behaviours among employees and shed light on the significance of cultural context in shaping the outcomes of environmental training programmes. The study found that environmental training had a significant positive effect on both employee commitment to environmental causes and EIGP. The researchers concluded that providing effective environmental training and knowledge to employees can motivate them to take on environmental responsibilities, which is crucial for achieving green performance.

Also, Yafi et al. (2021) undertook an empirical study to investigate the connection between environmental performance and environmental training, with a focus on the role of green competencies and motivation in the adoption of green human resource management. The aim was to raise awareness of the different situations that exist in Malaysian public and private universities with regard to their adoption of GHRM practices and environmental management policies. The research found that green incentives were present in all six aspects of green competencies, including knowledge, abilities, skills, attitude, awareness, and behaviour. Moreover, the study revealed that environmental training had a significant positive impact on environmental performance, and that both green competencies and incentives played a mediating role in the relationship between environmental performance and environmental training. The study recommended that companies invest in environmental management to meet the growing demand for eco-friendliness in all business activities by stakeholders.

Al-minhas et al. (2020) also provided a comprehensive and integrative approach to understanding the interplay between employee environmental training and sustainable green logistics management. It highlights the various dimensions of logistics management practices that can be "greened," and the role of environmental training in enhancing employee environmental performance in organisations. The model also

emphasizes the importance of management and employee attitudes, knowledge, and skills in mediating the link between green training and sustainable green logistics management. The study's findings have several practical implications for businesses and managers. First, the model can be used as a guide for businesses to identify areas in their logistics management practices that can be "greened" and to develop a comprehensive approach to sustainability. Second, the model highlights the importance of green practices such as training, development, pay, rewards and recognition, recruitment, and performance management in enhancing environmental performance.

Cop et al. (2020) investigated the influence of environmental training on environmental commitment and organisational citizenship behaviour by exploring the mediating role of perceived behavioural control. The study's findings suggest that green training has a positive impact on both environmental commitment and organisational commitment, and this relationship is completely mediated by perceived behavioural control. Therefore, the study emphasizes the importance of prioritizing environmental sustainability in all firms and underscores the significance of environmental training in the hospitality industry to maintain a sustainable and healthy environment.

Srivastava and Shree (2019) also undertook a similar study to explore the connection between the participation of employees in environmental initiatives, their perceptions of corporate environmental commitment (CEC), and the potential moderating effect of green training (GT). The results revealed a positive correlation between GI and employees' perceptions of CEC. Additionally, when GT was incorporated, the study found a positive relationship between GI and perception of CEC. Therefore, the authors suggested that organisations should use GT to promote environmentally and socially responsible practices among employees, which could result in employees' engagement in activities such as improving the working environment, ensuring employee welfare, producing high-quality products for customers, and complying with government regulations. The study establishes a relationship between green involvement, green training, and perception of CEC. However, it does not establish causality, and other unmeasured factors may influence these relationships.

Singh et al. (2019) investigated the relationship between employee environmental ethics, environmental training, environmental performance, and competitive advantage. The findings revealed that employee environmental ethics had a positive impact on a

company's environmental performance, environmental training, and competitive advantage. Moreover, the study found that the relationship between employee environmental ethics and a company's environmental performance and competitive advantage was mediated by environmental training for employees. Thus, the authors recommended that companies should invest in environmental training for their employees to enhance their environmental performance and gain a competitive advantage in the marketplace.

Collectively, these empirical studies contribute significantly to the understanding of the positive impact of environmental training on employee environmental outcomes. The consistency in findings across diverse industries and regions underscores the importance of prioritizing employee environmental sustainability within organisations. The nuanced exploration of mediating and moderating factors adds depth to the understanding of the complex relationships involved. Overall, these empirical reviews collectively advocate for the integration of environmental training as a key strategy for organizations striving to enhance their environmental performance and sustainability.

### **2.3.3 Supplier Environmental Orientation and Firm Environmental Performance**

Bu et al. (2020) conducted a study to examine the relationship between environmental orientation and business environmental performance in small and medium-sized Chinese businesses, with the mediating role of green supply chain management. The results showed that there is a positive relationship between both internal and external environmental orientation and the three elements of green supply chain management: environmental selection, monitoring, and supplier collaboration. Furthermore, all three elements of green supply chain management were found to be positively associated with business performance. The study suggests that Chinese managers should invest in environmental operations, work with key suppliers to develop environmentally friendly components and materials, conduct eco-friendly R and D projects, and modify production processes to reduce environmental impact.

Also, Qiao et al. (2022) conducted an empirical investigation of buyer-supplier relationships to determine whether a supplier's environmental commitment is influenced by the perceived environmental activities of the buying firm and the fairness

and attractiveness of the partnership. The results of the study on the relationship between environmental collaboration, environmental assessment, supplier-perceived relationship attractiveness, perceived justice, and supplier environmental commitment, environmental collaboration has a positive impact on supplier environmental commitment, while the impact of environmental assessment is not very significant. However, the study found that the supplier-perceived relationship attractiveness has a positive moderating effect on the influence of environmental assessment and collaboration on the supplier's environmental commitment. Additionally, the results of moderated moderation analysis showed that both of these moderating effects are positively moderated by the supplier's perceived justice.

Chavez et al. (2022) on the other hand conducted a study that proposed a comprehensive system for exchanging environmental information with suppliers, which incorporated several contingency factors such as environmental product design, cost performance, and environmental performance. The study revealed that environmental product design fully mediated the relationship between environmental information exchange and cost performance. Additionally, digital orientation did not affect the link between environmental information exchange and environmental product design but moderated the relationship between environmental product design and cost performance. The findings of the study provide useful insights into effective sustainable supply chain management practices for companies that are seeking to implement circular business models and achieve economic benefits.

That notwithstanding, Bai et al. (2020) also conducted a research study focusing on the impediments faced in implementing supplier environmental development (SED) programs within the manufacturing sector. SED has gained increasing significance within the domain of green supply chain management, primarily due to the substantial environmental impact associated with supplier environmental performance in the manufacturing industry (Bai et al., 2020). For the successful execution of GSD programs, manufacturing firms need to proactively identify and address barriers that may hinder their green supplier development initiatives.

Furthermore, Sancha et al. (2016) conducted a study with the objective of evaluating the effectiveness of governance mechanisms, whether they are transactional or relational, in the management of buyer-supplier relationships concerning

environmental issues. The study's results revealed that both transactional and relational mechanisms can lead to suppliers' commitment to environmental issues, but their effectiveness depends on specific conditions. The study also drew managerial implications from these findings, emphasizing the importance of governance mechanisms in buyer-supplier relationships concerning environmental concerns and the need to consider specific conditions for their effective application.

A study conducted by Villena et al. (2021) delved into supplier environmental responsibility, with a focus on identifying distinct drivers associated with this dimension. The research finding demonstrated that supplier environmental orientation can be effectively promoted through both stakeholder pressures and relational drivers.

#### **2.3.4 Green Logistics Management Practices**

Baah et al. (2020) investigated the impact of organisational and regulatory stakeholder pressure on green logistics practices and financial performance, as well as the mediating roles of environmental reputation (ER) and social reputation (SR). The results of the study indicated that regulatory stakeholder pressure has a significant impact on social reputation, which in turn affects financial performance. The study suggests that logistics companies should adopt and implement green logistics practices to enhance their environmental reputation, which can subsequently improve their financial performance and competitive advantage. The research also found that organisations and regulatory stakeholders should use their influence to push companies towards adopting and implementing Green Logistics Practices (GLPs) to promote eco-friendly practices such as reducing the use of hazardous materials, conserving resources and energy, and improving material handling and storage efficiency.

Also, Agyabeng-Mensah et al. (2020) developed a theoretical framework to assess the effectiveness of combining green logistics management practices with social, environmental, market, and financial performances to achieve sustainable performance. The study aimed to investigate the direct impact of green logistics management practices on environmental, social, market, and financial performances. The results indicated that green logistics management practices had a significant positive impact on environmental performance but had little effect on social, market, and financial performance. The study recommended that organisations implement more green logistics management practices that accommodate the environmental needs of

stakeholders to enhance environmental performance and subsequently increase market and financial performance. Additionally, the study recommended allocating more resources towards green logistics management practices, such as sustainable energy, recycling, sustainable transportation and distribution, sustainable warehousing, and green product packaging, to achieve environmental goals and improve the financial and market performance of companies.

Kumar (2022) conducted an empirical study that examined the influence of sustainable logistics practices and supplier support on the transport performance of logistics providers in Malaysia. The study aimed to emphasize sustainable logistics practices and assess the performance of transport service providers who offer transportation services to manufacturers, utilizing the triple bottom line approach, which has been relatively under-explored. By adopting this approach, the study aimed to bridge the knowledge gap that exists in sustainable logistics research, which usually concentrates on a single dimension or combines two dimensions based on economic and environmental factors only. The findings of the study revealed that sustainable logistics practices applied by the transport service provider significantly enhance the performance of logistics transport from the perspective of transport users. Furthermore, the study also highlights the importance of interdependence in business relationships, which allows focal firms and partnering firms to combine their resources and capabilities, ultimately leading to better organisational performance and sustainable competitive advantage. The study focuses on the perceptions of manufacturers regarding transport logistics services and their sustainable practices. This might limit the generalisability of the findings to other stakeholders or industries within the logistics sector. The study might be limited by its reliance on a specific methodology, such as surveys or interviews, to gather data. Using a combination of methods could provide a more comprehensive understanding of the topic. While the study examines the mediating effect of buyer-supplier relationships, there might be other variables that contribute to the relationship between sustainable logistics practices and performance that are not considered in the framework.

Moinuddin et al. (2018) investigated the key drivers of green logistics in BRICS countries while also addressing socioeconomic and environmental concerns. Using time series data from 1995 to 2015, the study examined six logistics performance indices, including consignment tracking, logistics quality services, competitively priced shipments, customs clearance process, consignments schedule to reach within expected

time, and transport and trade infrastructure. The study found that there is a positive correlation between the green logistics index and a country's per capita income, indicating that supply chain management should be integrated with a country's economic growth and environmental policies to ensure long-term benefits. The study used non-parametric panel FMOLS and parametric DOLS estimators to establish a long-term integration relationship between logistics performance indicators and factors related to socioeconomic and sustainable development. The study concluded that social factors play an important role in the development of logistics performance indices, and that policies should be developed that consider both social and economic factors to strengthen the supply chain process and provide long-term support for high-quality infrastructure in BRICS nations.

### **2.3.5 Top Management Commitment on Firms Environmental Performance**

Nguyen et al. (2023) conducted a study in the Vietnamese electric power sector to investigate the effects of top management support on an organisation's environmental performance. They aimed to examine the impact of top management support on green training, the direct relationship between top management support and an organisation's environmental performance, and the mediating effect of green training on the relationship between top management support and environmental performance. The results showed that top management support has a direct influence on environmental performance and green training. The study also found that green training mediates the relationship between top management support and environmental performance. The authors recommended that senior managers in emerging economies should view green training as a strategic investment rather than a cost centre. They also suggested that managers should provide green training to their employees to improve their environmental knowledge and skills related to sustainable energy consumption, not just for work purposes but also in their personal lives, as environmental sustainability is currently in the interest of all stakeholders. The study focuses specifically on the Vietnamese electric power sector, which may limit the generalisability of the findings to other industries or contexts. The data collected through surveys may be subject to self-report bias, as respondents may provide socially desirable responses or overstate their support for environmental practices. Expanding the research to include multiple levels of analysis, such as individual, team, and organisational levels, could provide a more comprehensive understanding of how top management support cascades through

the organisation to influence environmental performance. Exploring other potential mediators between top management support and environmental performance, beyond green training, could help uncover additional factors that facilitate the link between top management support and positive environmental outcomes.

Siagian et al. (2022) conducted a study to explore the relationship between top management commitment, supplier integration, customer integration, green innovation, and competitive advantage. The researchers reviewed relevant literature and identified nine direct relationships and five indirect relationships for investigation. The study findings showed that top management commitment had a direct influence on supplier integration, green innovation, and customer integration. However, competitive advantage was not directly affected by top management commitment. Instead, it was influenced by supplier integration, green innovation, and customer integration. The study recommends that companies should collaborate with suppliers and customers to improve their competitive advantage and overcome competition. Additionally, the study highlights the significance of customer integration, green innovation, and supplier integration in enhancing competitive advantage, especially in today's competitive market, which is characterised by changing customer preferences towards environmental concerns. The study focuses on immediate effects of top management commitment and integration on competitive advantage and green innovation. Future studies could investigate the long-term sustainability and durability of these effects over time. The study captures a snapshot of the relationships at a specific point in time. Future research could adopt a dynamic perspective to explore how these relationships evolve and change over time in response to changing internal and external factors

Haldorai et al. (2022) conducted a research study with the aim of investigating the effects of top management's commitment to the environment and its green intellectual capital on green human resource management and the environmental performance of hotels. The study results suggest that top management's commitment to sustainability and their knowledge in this area have a direct influence on the green human resource management practices and environmental performance of hotels. In addition to the direct impact of top management's commitment to sustainability and green intellectual capital on green human resource management and hotel environmental performance, the study also found evidence of mediated relationships. According to the study's results, the success of GHRM and HEP is highly dependent on top management's

commitment to environmental sustainability. The study concludes that to achieve strong environmental performance, green drivers such as top management commitment and green intellectual capital are essential, and that GHRM can serve as a mediator between these drivers and the environmental performance of hotels. The results might not be generalizable to other regions or types of hotels, limiting the external validity of the findings. Also, the data for all variables in the study was collected from the same source (participants), there is a potential for common method variance, which could inflate the relationships between variables. As a result, combining self-report data with other data sources (e.g., objective performance metrics) or using qualitative methods could provide a more comprehensive and accurate understanding of the relationships under investigation. Furthermore, to enhance the generalisability of the findings, future research could replicate the study in different geographic locations, types of hotels (e.g., luxury, budget), and industries beyond hospitality.

Tanuwijaya et al. (2021) investigated the relationship between top management commitment, corporate social responsibility (CSR), green human resource management (GHRM), green purchasing, supplier relationship management, and firm performance in the 3-star hotel industry in Surabaya. The results showed that top management commitment significantly influenced supplier relationship management and business performance, but did not have a significant influence on green purchasing. Supplier relationship management had a significant effect on green purchasing and firm performance. Additionally, green purchasing significantly impacted business performance. The study recommends that hotel top management should prioritize promoting the company's sustainability efforts, maintaining positive working relationships with key suppliers, and implementing eco-friendly purchasing practices. The theory used in this study is not explicitly mentioned in this study. However, the study appears to be aligned with supply chain management and organisational behaviour theories. The concept of top management commitment influencing various aspects of supply chain management and its impact on firm performance is consistent with theories related to leadership and organisational behaviour. Additionally, the focus on green purchasing and supplier relationship management suggests an integration of sustainability and supply chain management theories.

Cao and Chen (2019) conducted a study to investigate the factors that influence firms' adoption of green innovation strategies, with a focus on the moderating effect of top management's environmental awareness. The study also found that top management's environmental awareness positively moderates the relationship between policy pressures, innovation resources, and green innovation strategy, indicating that top management's environmental awareness plays a crucial role in promoting firms to adopt green innovation strategies in response to external and internal environmental pressures. Future studies could consider validating self-reported survey data with objective performance metrics or other external sources to enhance the reliability of the findings.

### **2.3.6 Corporate Environmental Orientation and firm performance**

Hirunyawipada and Xiong (2018) carried out a research study to investigate the interdependent relationship between corporate environmental commitment (CEC) and firm performance. They examined how a company's financial gains or losses and functional capabilities contribute to CEC. The study found that corporate environmental commitment (CEC) has a positive impact on both short-term profitability and long-term value for firms with strong marketing capabilities. They recommend that companies with strong marketing and operational capabilities should not hesitate to engage in green efforts despite perceived expenses and risks associated with CEC, as such efforts can bring benefits in both the short and long term. The study also suggests that the relationships between CEC capacity and firm performance differ in their influence on short-term versus long-term performance.

Lee et al. (2018) carried out a study aimed at assessing the level of organisational commitment towards corporate environmental responsibility and green practices in the logistics sector in South Korea. The results revealed that the implementation of corporate environmental responsibility and green practices was significantly influenced by social expectations, organisational support, and stakeholder pressure. Path analysis showed that social expectations had the most significant impact on stakeholder pressure and the adoption of green practices. The study also found that higher job titles were associated with increased motivation to adopt green practices, indicating that top management in Korean logistics companies are aware of the importance of adopting green business practices and demonstrating corporate environmental responsibility.

While the study suggests relationships among the variables, the cross-sectional design limits the ability to establish causal relationships definitively.

Li et al. (2020) conducted a study to develop a comprehensive measurement of corporate environmental responsibility (CER) engagement and examine its relationship with firm value. The study found that although CER initially has a negative impact on firm value as companies adapt to environmental regulations, it eventually leads to an increase in firm value. Furthermore, corporate innovation serves as a mediator in the relationship between CER and firm value, with CER-positive firms benefiting more from corporate innovation than CER-negative firms. These findings suggest that companies can improve their competitive advantage, corporate innovation capabilities, and ultimately increase their firm value by increasing their environmental responsibility. The study's results are relevant for government, investors, and firm managers and can inform policy and investment decisions. The study focused on China's A-share listed companies from a specific time period (2008 to 2016). The results might not be generalizable to other countries or industries. Examining how the relationship between CER engagement and firm value varies across different industries could yield insights into industry-specific dynamics and challenges.

Dixon-Fowler et al. (2017) explored the relationship between board environmental committees and corporate environmental performance (CEP). They posited that the existence of board environmental committees would be positively linked to CEP. Furthermore, they argued that the composition of these committees, particularly in terms of stakeholder representation, as well as the presence of a sustainability manager, would impact this relationship. The study's results supported the hypothesis that board environmental committees had a positive association with CEP. It was also observed that the presence of a senior-level environmental manager positively moderated this relationship, although it was ineffective when considered alone. Surprisingly, the findings did not provide evidence for the influence of stakeholder representation on the relationship between board environmental committees and CEP.

Gangi et al. (2020) conducted a study to investigate how corporate environmental policy and corporate reputation influence risk-adjusted financial performance. They employed a comprehensive framework that involved analyzing a sample of firms tracked by the Reputation Institute. The study revealed several significant findings.

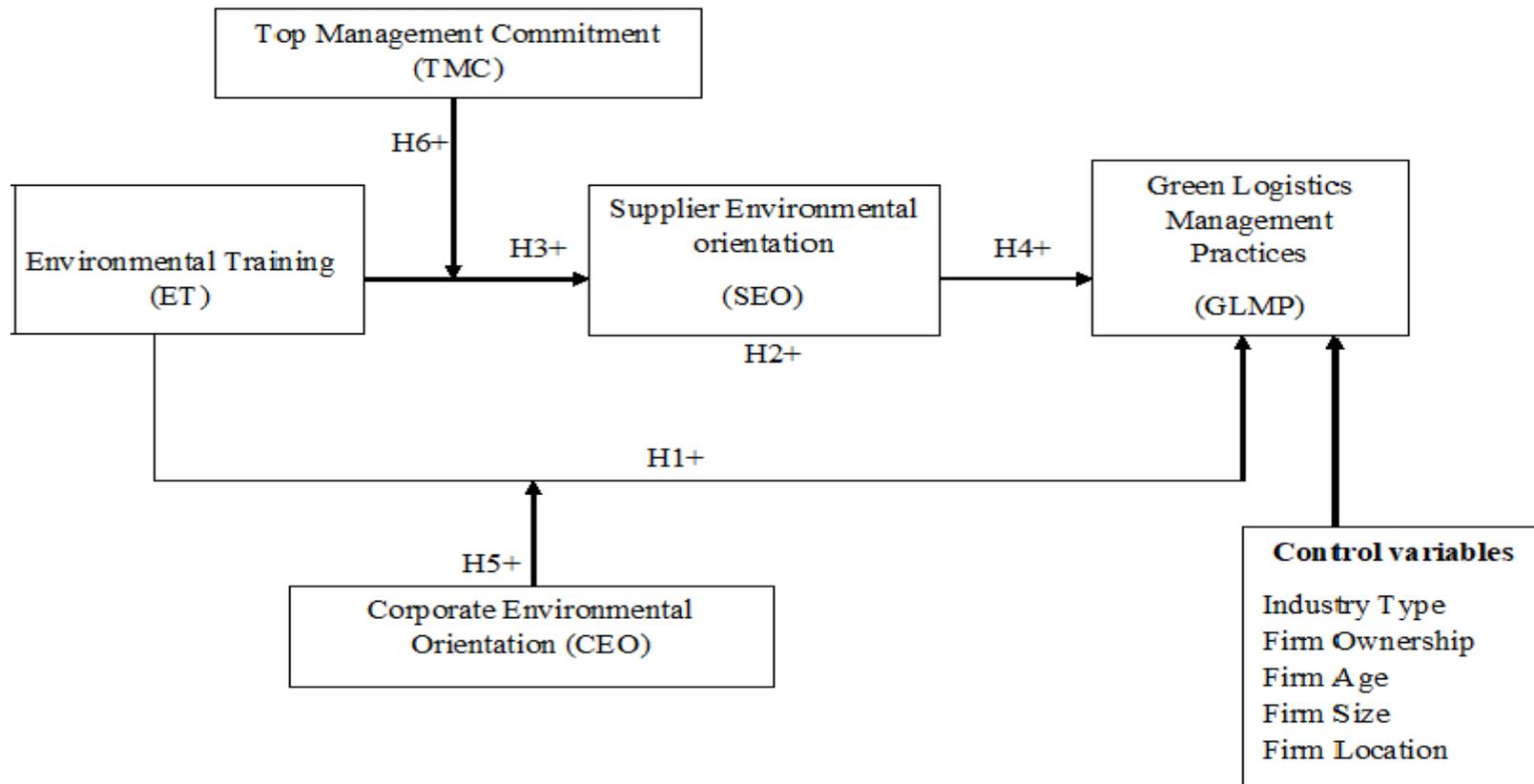
Firstly, they found that environmental engagement and green product innovation were both factors that influenced corporate reputation positively. Secondly, corporate reputation had a positive impact on risk-adjusted profitability and the Z score indicator of financial distress risk. This suggested that corporate environmental responsibility and green practices represented specialized assets that enhanced an intangible asset, corporate reputation, which in turn served as a crucial link between sustainable development and a firm's financial performance.

#### **2.4 Conceptual Framework**

In this section of the study, the researcher presents a conceptual framework that outlines the essential variables and their interrelationships in the subject matter of the study. The conceptual framework includes a detailed explanation of the variables, their relationships, and a schematic design to aid readers in understanding the conceptual and theoretical relationships. The researcher also provides relevant hypotheses to test the theorised relationships and the underlying assumptions.



## 2.4.1 Conceptual model



**Figure 2.1 Conceptual model**  
*Source: Author's construct 2023*



#### **2.4.2 Environmental Training and Green Logistics Management Practices**

Organisations that quest to improve their environmental performance must find a balance between both GHRM practices and corporate environmental management practices such as green logistics management practices (Al-minhas et al., 2020). The logistics function is crucial in both local and global organisational supply chains due to its strong connection with human resources issues, as it requires significant human input (Santos, 2000). Human resources are a crucial aspect of logistics management because the logistics process involves a range of activities that require human labour, such as receiving and processing orders, receiving and storing goods in warehouses, managing inventory, loading and unloading goods, and operating vehicles for transportation (Cirulis and Ginters, 2013; Al-minhas et al, 2020).

GHRM practices, particularly environmental training, play a critical role in shaping employee attitudes, knowledge, and skills, which can directly impact the implementation of green logistics management practices in an organisation. Studies have found that employees who receive environmental training are more likely to adopt environmentally friendly practices in their work and demonstrate a higher level of environmental awareness (Pinzone et al., 2019; Pham et al., 2020; Yong et al., 2020). Therefore, providing environmental training to employees can positively influence the adoption of green logistics practices in an organisation.

Jabbour and Jabbour (2016) emphasized that to improve environmental practices and achieve sustainable performance, environmentally oriented organisations need to prioritize environmental training. Environmental training is crucial because it helps employees to develop problem-solving skills that enable them to generate solutions to environmental challenges. Additionally, it assists in aligning corporate policies and strategies regarding environmental protection. Pinzone et al. (2019) and Pham et al. (2020) have also supported the idea that environmental training is a crucial aspect of green human resource management practices. This implies that environmental training can have a positive impact on green logistics management practices.

The positive relationship between environmental training and green logistics management practices can also be understood through the theoretical lens of the natural resource-based view of the firm. The Natural Resource-Based View (NRBV) theory suggests that an organisation's interaction with the environment is critical for

developing capabilities that can lead to competitive advantage. By implementing green logistics management practices and environmental training, companies can focus on developing these capabilities and gaining a competitive advantage (Hart, 1995; Aboelmaged, 2018). As a result, companies should focus on the natural resources and capabilities that can help them gain a competitive advantage, such as implementing environmental training and green logistics management practices (Aboelmaged, 2018). Inferring from the NRBV theory, environmental training is viewed in this study as an important inimitable natural resource that can help develop an environmental management practice, an environmental culture, and well-trained employees that are environmentally conscious and can detect and minimise waste (Aragão and Jabbour, 2017). In this study, green logistics management practices are considered a fundamental natural capability that organisations must possess to achieve a competitive advantage. This capability involves adopting environmentally sustainable principles and strategies in logistics operations, with the aim of conserving energy and resources, reduce negative environmental and societal impacts, and enhance firm performance (Agyabeng-Mensah et al., 2020a).

The argument here is that because environmental training is an important strategic resource that can facilitate the implementation of an environmental management practice (Pinzone et al., 2019; Pham et al., 2020; Obeidat et al., 2020), therefore, it is probable that environmental training, being a significant strategic resource for implementing environmental management practices, would have a positive impact on green logistics management practices. The study aligns with the NRBV theory's premise that a company's success should be based on its natural resources and capabilities that promote environmentally sustainable economic activities (Hart, 1995, p. 991). The study considers green logistics management practices as a natural capability that is essential for companies to gain a competitive advantage by implementing environmentally friendly strategies and principles that conserve energy and resources. Based on the argument presented, the study puts forth the following hypothesis:

*H1: Environmental training has a positive relationship on green logistics management practices.*

### **2.4.3 The Mediating role of Supplier Environmental Orientation**

The adoption of an environmental orientation is acknowledged as an effective approach to enhance and broaden the environmental management practices and behaviours of organisations (Bai and Satir, 2020). Put differently, if an organisation fails to effectively handle its external environmental management practices, it could negatively impact the organisation's environmental performance (Li *et al.*, 2018). This is due to the greater reliance on external partners in the supply chain. As a result, any environmental problem that arises anywhere in the supply chain can not only disrupt the operations of the purchasing company but also have far-reaching consequences throughout the entire supply chain (Kong *et al.*, 2021). This study defines supplier environmental orientation as the incorporation of environmentally conscious ideas into the environmental and organisational procedures of suppliers (Yu and Huo, 2019). Therefore, supplier environmental orientation refers to the conscious actions taken by suppliers to reduce their environmental footprint during the entire life cycle of a product. This includes activities such as designing environmentally friendly products, selecting sustainable raw materials, delivering finished products in an environmentally friendly way, and managing the end-of-life of the product in an environmentally responsible manner. This concept has been highlighted in previous studies (Giovanni and Vinzi, 2012; Jabbour *et al.*, 2014; Perotti *et al.*, 2012).

While it was argued in the preceding section that environmental training positively influences green logistics management practices, it is not satisfactory in itself if environmentally oriented organisations do not recognise the effects of the external supply partners in their effort to implement environmental management practices (Chavez *et al.*, 2022). This means that companies that are committed to environmental sustainability are more likely to actively seek out suppliers who can provide knowledge and resources to help them develop and implement environmental sustainability strategies (Zhou *et al.*, 2020). The reason being that environmentally oriented suppliers are seen as a key resource that enables business organisations to effectively implement environmentally sustainable policies and practices (Chavez *et al.*, 2021; Chan and Ma, 2021). Therefore, by promoting environmentally conscious practices, supplier environmental orientation can help implement corporate environmental management practices, such as green logistics management practices. Collaborative buyer-supplier relationships can be utilised to address environmental issues, which can create business

opportunities and competitive advantages for both the buying and supplying organisations (Qiao et al., 2022).

The buying organisation can collaborate with its external supply chain partners to create business opportunities and competitive advantages by promoting environmental responsibility. This is achieved through providing environmental training and support to supply chain partners to develop a culture of environmental responsibility. Developing such a culture is considered an essential capability for organisations to successfully implement environmental management practices and strategies (Gimenez et al., 2012; Yadlapalli et al., 2018).

The argument is that environmental training can positively impact the supplier's environmental orientation, which, in turn, affects the implementation of green logistics management practices. This suggests that supplier environmental orientation mediates the relationship between environmental training and green logistics management practices. By providing environmental training to suppliers, the buying organisation can influence their environmental orientation, leading to the adoption of environmentally sustainable practices such as green logistics management practices.

Previous research has indicated that environmental orientation can serve as a mediator between environmental training and corporate environmental management practices. For instance, researchers such as Yusliza et al. (2017) and Chaudhary (2020) have found that effective GHRM practices, including environmental training and development, can positively impact an organisation's environmental performance by promoting waste reduction and organisational efficiency. Based on previous studies, it has been shown that supplier environmental orientation is a significant factor in the relationship between environmental training and corporate environmental management practices. Qiao et al. (2022) also found evidence supporting the positive relationship between corporate environmental practices and supplier environmental commitment.

The NRBV theory highlights that resources that are rare, difficult to imitate, and non-substitutable are more likely to provide competitive advantage (Barney, 1991). Supplier environmental orientation, as defined in the argument, encompasses a set of conscious actions taken by suppliers to reduce their environmental footprint throughout the product life cycle. Such a commitment by suppliers can be considered rare, especially in industries where sustainability practices are not widespread. The challenge of

replicating or substituting suppliers with a similar level of environmental orientation can enhance their value as unique resources.

The proposed hypothesis that supplier environmental orientation acts as a mediator between environmental training and green logistics management practices finds support in the NRBV theory (Qiao et al., 2022). The theory suggests that resources contribute to the firm's competitive advantage through their impact on strategic decisions and practices (Barney, 1991). In this case, supplier environmental orientation serves as a conduit through which the benefits of environmental training are translated into the implementation of green logistics practices (Gimenez et al., 2012; Yadlapalli et al., 2018). The integration of sustainable practices at the supplier level enhances the overall value chain and contributes to the organisation's competitive advantage.

Therefore, this study hypothesizes that supplier environmental orientation will act as a mediator between environmental training and green logistics management practices (Chavez et al., 2021; Chan and Ma, 2021).

*H2: Supplier environmental orientation mediate the relationship between environmental training and green logistics management practices.*

#### **2.4.4 Environmental Training and Supplier Environmental Orientation**

Environmental training is recognised as a critical mechanism for equipping organisations and their partners with the necessary knowledge and skills to adopt and implement environmentally responsible practices. Bai and Satir (2020) emphasize that such training programs aim to enhance the environmental management practices and behaviours of organisations. Li et al. (2018) further underline the potential consequences of inadequate environmental management, highlighting the interconnectedness of organisations within the supply chain. Kong et al. (2021) emphasize that disruptions in any part of the supply chain can reverberate throughout, emphasising the importance of collaboration and environmental awareness among supply chain partners.

Supplier environmental orientation, a pivotal concept in this relationship, denotes the integration of environmentally conscious ideas into the procedures and operations of suppliers. Yu and Huo (2019) elaborate that supplier environmental orientation entails deliberate actions taken by suppliers to reduce their environmental footprint throughout

a product's life cycle. These actions encompass various practices, including eco-friendly product design, sustainable raw material selection, environmentally responsible transportation, and end-of-life management. Giovanni and Vinzi (2012), Jabbour et al. (2014), and Perotti et al. (2012) collectively provide a foundation for the understanding of supplier environmental orientation and its significance in contemporary supply chain contexts.

Numerous studies have investigated the link between environmental training and supplier environmental orientation. Chavez et al. (2022) argue that for organisations committed to environmental sustainability, recognizing the influence of external supply partners is crucial in implementing successful environmental management practices. Zhou et al. (2020) assert that environmentally oriented organisations are more likely to actively seek out suppliers who can contribute to the development and execution of environmentally sustainable strategies. Chan and Ma (2021) reinforce the notion that environmentally oriented suppliers play a pivotal role in implementing sustainable policies.

The upper echelon theory, introduced by Hambrick and Mason (1984), provides a theoretical foundation for understanding the influence of top executives on organisational decisions and outcomes. This theory underscores that the cognitive orientations and backgrounds of top management shape organisational strategies. In the context of environmental training and supplier environmental orientation, the upper echelon theory highlights the role of organisational leaders in recognizing the significance of supplier relationships in achieving environmental sustainability goals. This recognition influences their decision to invest in environmental training programs that foster supplier environmental orientation.

Environmental training serves as a tool for nurturing a culture of environmental responsibility among suppliers. This aligns with the upper echelon theory's emphasis on top management's ability to recognise external pressures and opportunities and drive the firm's strategy using internal resources (Ma et al., 2020). The leadership's commitment to environmental training reflects their awareness of the strategic implications of supplier environmental orientation. The upper echelon theory supports the idea that top management's cognitive orientations influence their perception of

supplier-related environmental issues, leading to strategic decisions that prioritize environmental training initiatives.

The relationship between environmental training and supplier environmental orientation is rooted in the idea of leveraging knowledge and skills to foster environmentally conscious behaviours among supply chain partners (Giovanni and Vinzi, 2012). This investment, in turn, supports the development of supplier environmental orientation and contributes to the achievement of environmental sustainability goals within the supply chain.

Therefore, this study hypothesizes that there is a direct positive relationship between environmental training and supplier environmental orientation.

*H3: There is a direct and positive relationship between environmental training and supplier environmental orientation.*

#### **2.4.5 Supplier Environmental Orientation and Green Logistics Management Practice**

The pursuit of environmental sustainability within supply chains has prompted an exploration of the relationship between supplier environmental orientation and green logistics management practices (Yu and Huo, 2019). Supplier environmental orientation is a crucial concept that reflects the extent to which suppliers incorporate environmentally conscious ideas into their operations (Kong et al., 2021). This concept is echoed in the studies of Giovanni and Vinzi (2012), Jabbour et al. (2014), and Perotti et al. (2012), which collectively lay the foundation for understanding supplier environmental orientation within the context of sustainable supply chains.

Research exploring the relationship between supplier environmental orientation and green logistics management practices indicates a positive connection between the two concept (Bai and Satir, 2020; Chan and Ma, 2021). Chavez et al. (2021) emphasize that supplier environmental orientation plays a pivotal role in organisations' ability to implement green logistics practices effectively. Zhou et al. (2020) posit that environmentally oriented suppliers are viewed as valuable resources, capable of contributing to the successful execution of sustainable strategies. This aligns with Chan and Ma's (2021) findings, which underscore the role of supplier relationships in facilitating the implementation of green logistics practices.

The upper echelon theory, introduced by Hambrick and Mason (1984), provides a theoretical framework for understanding the role of top management in influencing organisational outcomes. In the context of supplier environmental orientation and green logistics management practices, the upper echelon theory suggests that top management cognitive orientations and backgrounds influence their perception of the importance of supplier behaviours (Qiao et al., 2022). This, in turn, affects their decision-making regarding investments in supplier relationships that prioritize environmental orientation.

Theoretical support for this relationship can also be drawn from the Natural Resource-Based View (NRBV). The NRBV theory posits that firms gain competitive advantage through unique resources and capabilities, including environmental resources and sustainable practices (Wei et al., 2019). Supplier environmental orientation can be viewed as a resource that contributes to a firm's competitive advantage by facilitating the adoption of green logistics practices (Pinzone et al., 2019; Pham et al., 2020; Obeidat et al., 2020). The NRBV framework underscores the strategic significance of leveraging unique resources and capabilities to achieve enhanced performance in environmentally conscious markets (Hart, 1995, p. 991).

The literature indicates a positive and impactful relationship between supplier environmental orientation and green logistics management practices. Organisations recognise the value of environmentally conscious suppliers in facilitating the implementation of green logistics practices (Qiao et al., 2022). The upper echelon theory and the NRBV framework offer theoretical support by emphasising the role of top management and unique resources in shaping this relationship and achieving sustainable supply chain objectives. Based on the literature presented, the study puts forth the following hypothesis:

*H4: There is a direct and positive relationship between supplier environmental orientation and green logistics management practices.*

#### **2.4.6 The Moderating Role of Corporate Environmental Orientation**

The concept behind the moderating effect of corporate environmental orientation on the relationship between environmental training and green logistics management practices is that it can enhance and sustain the competitive advantage of an organisation. The assumption is that by integrating environmental concerns into a business strategy, corporate environmental orientation can reduce the negative impact of an organisation's activities on the environment. This integration is expected to maintain and enhance the competitive advantage of an organisation by improving its environmental performance and reputation (Banerjee, 2002). In this study, the term "corporate environmental orientation" is explained as the degree to which an organisation incorporates environmental concerns into its overall business strategy to reduce any negative impact of its activities on the environment (Hirunyawipada and Xiong 2018).

From the natural resource base view (NBRV) theoretical perspective, firms with superior environmental awareness results in an improved competitive advantage (Hart, 1995). This is due to the fact that corporate environmental orientation helps organisations to become greener in all aspect of their operations (Martín-de Castro et al., 2020). In addition, it improves the reduction of adverse effects on the environment, such as waste, material, and energy consumption, pollution-preventing and the creation of green products (Hart and Dowell, 2011).

Findings from empirical research provides a deeper insight into how corporate environmental orientation can facilitate or enhance the implementation of corporate environmental practices. Jackson (2018) for instance, argued that, environmental training of employees which falls under the common umbrella of corporate environmental orientation may increase the environmental awareness of employees, and this can foster a connection to the environment and enhance employees' adherence to the organisation's environmental goals, leading to improved environmentally responsible behaviour (Katou, 2015).

Agyabeng-Mensah et al. (2020), suggested that companies that adopt environmentally-friendly practices, such as green logistics management and green human resource management, can improve their reputation and attract stakeholders who are environmentally conscious, including employees, customers, and suppliers. This could result in a competitive advantage for the company and improved environmental

performance in the long run. Zaid et al. (2018) argued that implementing environmental practices such as environmental training can lead to improved environmental performance, which can result in superior sustainable performance for an organisation. Based on the discussion, it can be hypothesised that corporate environmental orientation moderates the relationship between environmental training and green logistics management practices in a positive manner.

*H5: Corporate environmental orientation moderates the relationship between environmental training and green logistics management practices.*

#### **2.4.7 The Moderating role of Top Management Commitment**

The NRBV theory suggests that a company's relationship with the natural environment is crucial for acquiring resources and capabilities needed to attain a sustainable competitive advantage. (Hart, 1995). It should be emphasized that the implementation of corporate environmental practices through the use of natural resources and capabilities is contingent upon the commitment and dedication of top-level management members in the organisation, as highlighted by various studies (Aboelmaged, 2018; Liu et al., 2020; Chavez et al., 2022).

Top management's commitment to environmental issues is a crucial factor in supporting and promoting environmental sustainability initiatives within an organisation. Several studies, including Ren et al., (2018) and Renwick et al. (2016), have emphasized the importance of top management in advancing environmental sustainability initiatives and providing support for them. The upper echelon theory suggests that the personal characteristics of top management, such as their ideologies and environmental beliefs, strongly influence the development of corporate environmental practices and culture (Hambrick and Mason, 1986). Raineri and Paillé (2016) and Obeidat et al. (2020) assert that top management and senior executives are responsible for determining the allocation of resources and identifying which environmental strategies are suitable for the organisation. Additionally, they play a crucial role in determining who is involved in the implementation of corporate environmental strategies.

Empirical research by Obeidat et al. (2020) and Nguyen *et al.* (2023) states that top management support for environmental sustainability is positively related to corporate environmental practice. Del Brio et al. (2001) argues that top management commitment to environmental issues and understanding of the benefits, limitations, and strategies of

environmental management have a positive influence on the importance they attach to environmental protection. Additionally, they recommended that top management should integrate their green organisational practices with that of other important stakeholder outside of the organisation in order to enhance their environmental performance, because when it comes to environmentally hazardous behaviour customers and other stakeholders seldom distinguish between supply chain actors, as they frequently blame the buying organisation for all supply chain activities (Qiao et al., 2022). Therefore, supplier's environmental orientation is recognised as a major factor in creating environmentally sustainable practices for the organisations under a situation of higher rather than lower commitment for the top management and senior executive members.

Based on the discussion above, it can be inferred that the commitment of top management has a moderating effect on the relationship between environmental training and supplier environmental orientation. Consequently, it is hypothesised that the commitment of top management to environmental issues has a positive moderating effect on the relationship between environmental training and supplier environmental orientation.

*H6: Top management commitment moderates the relationship between environmental training and supplier environmental orientation.*

## **2.5 Control Variables**

To avoid the possibility of obtaining biased results due to the omission of significant variables. This study includes a number of control variables that are frequently used in the analyses of corporate environmental management and its impact on company environmental practices and performance (Manrique and Martí-Ballester, 2017). This study uses the firm size, firm age, industry type, firm ownership, and firm location as control variable in this regard.

The size of a firm is one of the most important characteristics of a business organisation, because it indicates the number of employees in that organisation. The rationale for utilizing firm size as a variable in this study is based on the guidelines proposed by Zhu et al. (2012). To categorize firms based on their size, Judge and Elenkov's (2005) classification system was used, as cited by Paillé et al. (2014). According to this system,

firms with less than 100 employees were classified as small, those with more than 100 but less than 1,000 employees were classified as medium-sized, and firms with over 1,000 employees were categorized as large. Andersén et al. (2020) argue that large firms are better positioned to implement sustainable supply chain practices due to their greater resources and easier access to external resources. These resources are critical for implementing and maintaining sustainable supply chain practices.

The age of the firm refers to the length of time the firm has been in operation. It is often used as a variable in research to explore its relationship with various organisational outcomes, including environmental performance (Suárez-Perales et al., 2017). The number of years a firm has been in business is commonly used to measure how effective a company's governance system is overall. This factor is crucial because it may affect the workplace's image, reputation, and favourable working conditions, which may affect the company's ability to attract and keep valuable suppliers and customers (Awan et al., 2018).

To ensure the accuracy of the findings, the study incorporates the industry of the firm as a controlling factor. This is due to the fact that certain industries, such as those that heavily pollute, are regulated extensively to reduce their impact on the environment and society. By taking this variable into account, the study aims to compensate for the potential influence of industry-specific environmental regulations on the adoption and implementation of green logistics management practices in specific companies (Li et al., 2017).

The study considers firm ownership as a control variable because it may have an influence on both environmental and organisational performance. The ownership variable is classified into three groups: fully locally owned, fully foreign owned, and jointly local and foreign owned (Paillé et al., 2014).

To ensure that the impact of regional environmental regulations and practices is taken into account, this study includes the location (region) of the firm as a control variable. This is because different regions may promote different environmental programs and practices. This is consistent with the research by Manrique and Martí-Ballester (2017), who suggest that the type of environmental practices adopted and implemented by a firm may be influenced by its location.

## CHAPTER THREE

### RESEARCH METHODOLOGY AND PROFILE OF STUDY AREA

#### 3.0 Introduction

The aim of this chapter is to provide a comprehensive description of the methodology that was used in the research. It discusses the research philosophy and then proceed to explain the research design, study population, unit of analysis, sample size, and sampling technique. Additionally, the data collection method was discussed, including the questionnaire description, constructs, sources, and pilot testing, as well as the data analysis method. The chapter also addressed crucial considerations such as testing for validity and reliability, ethical concerns, and a brief overview of the study area.

#### 3.1 Research Philosophy

The concept of "research philosophy" refers to the method utilised for obtaining knowledge and the characteristics of that knowledge in a particular research investigation (Saunders et al., 2009). The decision to choose a research philosophy involves making critical presumptions about how the researcher perceives the world, which ultimately impacts the techniques and approaches utilised for conducting the research. Saunders et al. (2009) suggest that these assumptions form the basis for the key components of a study's methodology and strategy. A research philosophy typically guides decisions about how data should be collected, analysed, and used to gain knowledge about the research topic (Burrell and Morgan, 2000).

Bryman (2001) and Saunders et al. (2009) identified three key approaches that should be considered in research philosophy: epistemology, ontology, and axiology. These three approaches serve as the basis for research thinking and have a significant impact on the methodology and research instruments used. The research philosophy is determined by how these three elements interact with each other. The epistemological attitude defines what knowledge is deemed appropriate, the perspective of ontology determines the fundamental nature of reality, and the axiological perspective specifies the function or significance of values in research. Doyal (1993) and Saunders et al. (2009) suggest that the interplay between these three components shapes the research philosophy.

Research philosophy is also commonly referred to as a "paradigm," according to Mandago (2019). Collis and Hussey (2014) defined "paradigm" as a scientific practice that evolves based on individuals' beliefs and assumptions about the world and its nature. A paradigm provides a framework for conducting research by defining what can be studied, how it can be studied, and what tools and techniques should be employed in the research process. Another way to understand a research paradigm is as a set of fundamental assumptions and beliefs that shape the way in which researchers investigate and understand natural phenomena (Polit and Beck, 2008). Scholars such as Creswell (2003) and Saunders et al. (2009) have proposed that there are four major philosophical stances or research paradigms that are commonly employed in social and management research, namely positivism, realism, interpretivist, and pragmatism.

The positivist paradigm, which is also called the scientific method, adopts a reductionist approach and is based on a deterministic philosophy that assumes that causes are likely to influence the outcomes. The knowledge generated from this paradigm relies on careful observation and measurement of the external, objective reality that exists independently of the researcher. In contrast, the interpretivist paradigm is more concerned with how research participants interpret the situation being studied.

According to Saunders et al. (2011), this research approach places particular emphasis on the unique role that humans play in social activities and argues for the importance of conducting research among people rather than inanimate objects. Third, according to the realism paradigm, observable phenomena offer reliable information and facts. Sensations in this situation are inaccurate due to a lack of data (direct realism). A different possibility is that occurrences produce sensations that can be interpreted incorrectly (critical realism). Finally, according to pragmatic paradigms, knowledge claims are based on events, circumstances, and results rather than antecedent conditions. Studies that employ pragmatism focus more on results and problem-solving strategies than they do on methodology.

According to Johnson and Clark (2006), researchers must explicitly state their philosophical positions and provide justification for their selection in comparison to other feasible options. Saunders et al. (2009) contend that selecting a research philosophy is not a matter of one being inherently better or stronger than the others, as each approach has its own advantages and limitations. The decision ultimately rests on

the researcher to choose the approach that aligns with their research goals and enables them to collect the required data effectively.

Therefore, the positivist research paradigm was employed in this study by developing hypotheses based on existing theories. The adoption of the positivist research paradigm was justified by the fact that the study was grounded in theories from which specific hypotheses were developed. These hypotheses led to the collection of data that served as the foundation for subsequent hypothesis testing. This particular research paradigm asserts that knowledge for research already exists in the external environment and can be observed in the natural world. Moreover, factual representations of the world can be collected and analysed to identify certain truths or realities with a high degree of certainty, as well as to evaluate, confirm, or refute theories (Gephart, 2004).

### **3.2 Research Method**

A research method is a strategy that offers direction for conducting research efficiently and systematically (Esfahbodi, 2016). It involves a plan and a procedure that encompasses the necessary steps from broad assumptions through specific data collection techniques, analyses, and interpretation (Boohen et al., 2008; Creswell, 2014; Creswell and Clark, 2017). According to Saunders et al. (2009), in the realm of business and management research, two primary methods exist for collecting data: the quantitative approach, which emphasizes numerical data, and the qualitative approach, which highlights non-numeric data conveyed through words. Creswell (2003) states that questionnaires are often associated with the quantitative method, while interviews are typically associated with the qualitative method. Researchers have the option to use a single data collection method (mono-method) or multiple data collection methods (multi-method) (Saunders et al., 2009).

This study used a quantitative survey method, consistent with the chosen research philosophy (positivist paradigm) and research design (deductive logic for testing existing theory). The chosen quantitative survey methodology was considered suitable for this study because it could perform the empirical investigation required to answer the research questions. Quantitative survey methodology involved the collection of data from a large sample or the entire population through a structured questionnaire or survey instrument. The primary goal of this approach was to quantify and analyze the

responses in order to gain a better understanding of the participants' perspectives on a research problem

### **3.3 Study Population**

In research, the population refers to a group of individuals or entities who share common characteristics or traits that are relevant to the research question (Creswell, 2012). Burns and Grove (2010) define the population as the total number of people who meet the criteria for the research sample. Cavana et al. (2009) suggest that a research study generally involves a substantial number of individuals or entities that form the fundamental basis of the research, which is typically referred to as the research population.

The target population for this study was manufacturing, agricultural or agribusiness, mining or extraction, and logistics/transportation firms in Ghana. The Ghana Revenue Authority (GRA) database was used to determine the size of the target population. The GRA database contains reliable and accurate data on approximately 1179 registered tax-paying enterprises in Ghana, including the industry type, address, and contact numbers.

### **3.4 Unit of Analysis**

Every research project can make use of a variety of units of analysis (Nuertey, 2015). According to Cavana et al. (2009), they can be divided into categories (organisational issues), people (individual studies), groups (group interactions), dyads (two-person interactions), or cultures. The selection of a specific type usually relies on the level of data aggregation obtained during the data analysis phase, as noted by (Cavana et al., 2009).

The unit of analysis for this study is at the organisational level, focusing on the manufacturing, agribusiness, mining, extraction, and logistics/transportation sectors. The choice of the manufacturing, agribusiness, mining, extraction, and logistics/transportation sectors as the units of analysis is based on their significant impact on environmental pollution, high energy consumption, and waste disposal, leading to environmental degradation and adverse health effects on society (Agyabeng-Mensah et al., 2020). Therefore, business organisations operating within these sectors

have increasingly recognised the need to adopt various environmentally friendly practices to mitigate these negative impacts.

### 3.5 Sample Size and Sampling Technique

Sampling is a technique for picking people or a small portion of the population to draw conclusions from statistics and estimate population characteristics (Bryman, 2019). Sampling is the process of selecting a representative subset from a larger population, with the goal of obtaining information about the population with a high degree of accuracy and efficiency (Mandago, 2019). When a researcher is faced with difficulties in studying every aspect of a population, they need to use sampling to intentionally select a subset of individuals who provide data that can be used to draw conclusions about the larger group they represent (Nuerthey, 2015).

Various approaches have been proposed by researchers to determine the appropriate sample size for a study. Kothari (2004) suggests the census approach, which involves considering the entire population as the sample. Saunders et al. (2009) recommend using published tables that provide sample size estimates based on specific criteria, while another approach is to use the sample size of a similar study. Another method is to use a formula to calculate the sample size for proportions.

In accordance with Saunders et al. (2009), various factors influenced the determination of the sample size, including the acceptable margin of error, the level of confidence required in the data, the type of analyses to be conducted, and the size of the population from which the sample was drawn. To ascertain the suitable sample size for this study, the researchers employed the sample size estimation table devised by Krejcie and Morgan (1970). In line with this table, a sample size of 300 firms was selected from a total of 1178 respondents. The distribution and percentages of the selected respondents are presented in the table below.

**Table 3.1 Sample Distribution**

<b>FIRMS</b>	<b>POPULATION</b>	<b>RATIO</b>	<b>SAMPLE</b>
Manufacturing	354	0.300	106
Agriculture/Agribusiness	244	0.200	49
Logistics/Transportation	318	0.270	86
Minning/ Extraction	263	0.230	60
<b>Total</b>	<b>1179</b>	<b>1.000</b>	<b>300</b>

**Source: Author's construct, 2023**

The use of the sample size stated above, as a proportion of the entire population, is highly justifiable for the researcher in this study. First, it is impractical to investigate all the manufacturing, agricultural, mining, and logistics/transportation companies identified in the GRA's database. Secondly, despite the logistical and human resource limitations, the time required to complete this investigation just did not allow for such a thorough coverage. Consequently, selecting this sample size from the available population was justified for the investigation.

Saunders et al. (2009) classify sampling techniques into two types: probability sampling and non-probability sampling. Probability sampling is a sampling method that guarantees that the likelihood or probability of each case being selected from the population is known and often equal for all cases.

To achieve statistical estimates of a population's characteristics and address research questions in survey design, the probability sampling technique is frequently utilised. This approach involves four types of probability sampling techniques, which are simple random sampling, stratified random sampling, systematic sampling, and multi-stage sampling.

The non-probability sampling is employed when the researcher cannot make statistical inferences about a population or address research questions that require probability sampling because the chances of each case being selected from the population are unknown. This sampling technique involves methods like convenience sampling, quota sampling, and purposive sampling. When creating a sampling frame from a vast geographic area is impractical in terms of time and cost, multistage sampling strategies may be used as an alternative (Saunders et al., 2012).

In this study, the stratified sampling technique was used. This was achieved by categorizing the numerous organisations according to the distinct industries in which they operated. Then, using a proportional type of stratified sampling technique, respondents from each of the industries were chosen randomly, depending on the proportion of the organisation to the study's total population. This was to guarantee that all of the numerous organisations (sub-groups) were fairly represented and to enable generalization of the findings to all organisations.

### **3.6 Data Collection Method**

Data collecting instruments, as defined by Saunders et al. (2009), are the tools used to collect data for a certain research study. Muchesa (2016) explains that various tools can be employed to collect data, including surveys, questionnaires, standardized interview guidelines, and checklists.

The choice of a data collection method is primarily influenced by the available resources for data collection, including factors such as time and financial constraints, the researcher's expertise, and the desired level of precision (Bryman and Bell, 2015). Considering these factors, structured survey questionnaire was deemed appropriate due to their cost-effectiveness, speed, accuracy, and efficiency in gathering the necessary data for addressing the research questions (Forza, 2002). Structured questionnaire contribute to enhanced uniformity, leading to more reliable and consistent data (Neelankavil, 2007). Furthermore, this approach ensures that respondents experience heightened anonymity, privacy, and ease when participating in the questionnaire.

#### **3.6.1 Questionnaire Description**

The questionnaire was organized into six (6) sections, numbered A through F. Part A of Section A, which was divided into two sections, had questions about the respondents' biography, and Part B contained a profile of the firms' understudy. The aim of this was to group the participants based on their respective gender, age, and highest level of education in fields such as operations/procurement and supply chain management. Section B contained question items on the independent variable of the study which was environmental training. Section C assessed the mediating variable, supplier environmental orientation, using ten question items. The dependent variable, green logistics management practices were measured using (10) question items in Section D. Finally, the moderating variables, top management commitment and corporate environmental commitment for Sections E and F were represented by (7) and (6) question items respectively.

The question items in Sections B, C, D, E, and F were evaluated using a Likert-type scale ranging from 1 to 7, where 7 indicates the highest level of agreement, and 1 indicates the lowest level of agreement. Simms, et al. (2019) argue that this scale is among the most accurate in measuring people's opinions and views. Additionally, this

scale was suitable since it permitted the use of tools for data analysis that were both descriptive and inferential (Creswell, 2014).

**Table 3.2 Constructs and Sources**

<b>Variables</b>	<b>Number of Measurement Items</b>	<b>Sources</b>
Environmental Training (ET)	10	(Teixeira et al., 2016; Jabbour, 2015)
Supplier Environmental Orientation (SEO)	10	(Banerjee, 2002; Bu et al., 2020; Saghiri, 2021)
Green Logistics Management Practices (GLMPs)	10	(Agyabeng-Mensah et al., 2020; Baah et al., 2020; Saghiri, 2021)
Top Management Commitment (TMC)	7	(Haldorai et al, 2022)
Corporate Environmental Orientation (CEO)	6	(Banerjee, 2002; Cao and Chen, 2019)

**Source: Authors Construct, 2023**

### **3.7 Pilot Testing**

In this study, a preliminary study, commonly referred to as a pilot study, was conducted to assess the reliability, validity, and accuracy of the research questionnaire (Tabachnick and Fidell, 2007). Conducting a pilot or pre-test of the questionnaire was considered a crucial stage in survey design, as it allowed the researcher to identify and address any potential issues before the actual survey. This provided initial feedback to ensure the questionnaire's clarity and comprehensibility (Malhotra and Grover, 1998). The pilot test of the research questionnaire aimed to confirm that the research questions were easily comprehensible to the respondents and to identify any necessary adjustments before proceeding with the main survey. This process also assisted in determining whether additional questions needed to be included to achieve the study's desired findings.

In line with the pilot-testing techniques outlined by Forza (2002), a small group of academics, industry experts, and potential informants or respondents was sampled for this study to provide answers to the questionnaire. To ensure the effectiveness of the questionnaire used in the study in producing accurate and relevant results, a pilot test was conducted on a sample of 14 respondents who were selected randomly. The pilot test aims to verify the respondents' understanding of the research questions and identify any necessary additions or modifications to the questionnaire. Saunders et al. (2009)

suggests that pilot studies typically do not require a comprehensive and extensive sampling method. Therefore, the sample did not follow any rigorous sampling procedure for the pilot study.

The feedback obtained from the pilot study was utilised to improve the final questionnaire, enhancing the appropriateness and clarity of the questions and guaranteeing the content validity of the instrument. For example, the pilot study assisted in the removal of ambiguous statements in the questionnaire, particularly items in the Likert scale. Also, certain statements were completely omitted from the questionnaire, due to their repetition in other statements.

### **3.8 Data Collection Procedure**

The questionnaires were distributed to the research participants for completion through online questionnaire administration and self-administration by the researcher. This followed the pilot testing of the research instruments and the implementation of necessary modifications to enhance the effectiveness and credibility of the research instrument.

#### **3.8.1 The Online Survey Administration Procedure**

An online survey tool was utilised to create the online version of the questionnaire, specifically the Google document service, known as Google Forms. The online survey questionnaire included clear instructions for respondents on how to answer each question, aiming to prevent any confusion and ensure the survey's successful completion. Each question permitted respondents to select only one option from a range of choices, which served to reduce response bias and facilitate straightforward statistical analysis. The survey employed checkboxes for both demographic questions and questions featuring Likert-type scales to present the response options.

Moreover, the online survey employed a multi-page design to mitigate respondent fatigue. As noted by Sue and Ritter (2007), lengthy one-page surveys often lead to fatigue due to extended scrolling. To address this concern, a progressive approach was adopted by incorporating a progress bar on each page, indicating the completion percentage of the survey. This visual aid enabled respondents to estimate the time required for survey completion and prevented feelings of being overwhelmed or prematurely quitting. Furthermore, the web-based survey platform was configured to

prevent submission if any question was left unanswered, ensuring the collection of complete data necessary for thorough analysis.

In addition, the survey design included a feature that allowed respondents to revisit previous pages and revise their answers before final submission, thus promoting more accurate responses and enhancing the overall validity of the collected data (Sue and Ritter, 2007).

The online questionnaire was distributed to the targeted organisations using two methods: through WhatsApp and through an email invitation containing an embedded link. These delivery methods were chosen to ensure participants' privacy and facilitate their access to the questionnaire. The Google document tool, was employed to create and manage the survey, and it generated the link to the online questionnaire.

To alleviate any concerns and assure participants that the research was of an academic nature and not for commercial purposes, a statement clarifying that the survey was being conducted in collaboration with the Kwame Nkrumah University of Science and Technology (KNUST) was included in both the email and WhatsApp invitation.

### **3.8.2 Self-Administration Procedure**

The questionnaires were administered by the researcher in cases where organisations could not be reached for participation in the online survey. In order to secure authorization for the data collection process, a letter of introduction from the KNUST School of Business was obtained. This letter outlined the objectives of the questionnaire, underscored the significance of individual participation, and guaranteed the confidentiality and privacy protection of respondents' answers.

The distribution and collection of the questionnaire relied on the drop-off and pick-up strategy. This strategy was chosen due to its potential to enhance the response rate (Bryman, 2008). To accommodate respondents' busy schedules and ensure a swift and robust response rate, a 40-working-day period was allocated for the data collection process.

One questionnaire was distributed to a representative of each organisation. Subsequently, these representatives were requested to deliver the questionnaire to either their CEO, managing director, senior operations manager, senior procurement manager, senior supply chain manager, or senior logistics and transport manager. Along with the

questionnaire, a cover letter detailing the study's objectives and providing instructions on how to complete the questionnaire was provided to each participant.

### **3.9 Data Analysis Method**

Data collected through survey-based research must be organized, edited, coded, checked for errors, and subjected to some mathematical computations to be meaningful (Sekaran, 1984; Zikmund, 2012). Before conducting statistical analysis, Blumberg et al. (2008) argued that editing, sorting, and coding are necessary to check and validate errors in raw data. Data editing is conducted to validate that each questionnaire is completed and that each response is eligible to be included in the final analysis. On the other hand, the coding procedure is utilised to distinguish and classify each response together with the scores and associated numerical symbols (Zikmund et al., 2012).

Furthermore, data screening and cleaning are performed to check for missing values and data consistency before coding (Tabachnick and Fidell, 2001). These processes, in line with Tabachnick and Fidell (2001) and Hair et al. (2011), ensure that the underlying premises of data analysis methods are not violated while improving the accuracy of data analysis. Ensuring data accuracy is crucial for confirming irregular responses, means, standard deviations, and values for reliability.

This study utilised the approach of structural equation modelling (SEM) to assess the models, confirm their validity, and examine the hypotheses. Specifically, Confirmatory Factor Analysis (CFA) was used to evaluate the model, validate the constructs, and test the hypotheses (Ullman and Bentler, 2012). Path analysis was used to test the hypotheses (Beran and Violato, 2010). Complex relationships and latent constructs are present in this study, and SEM was therefore deemed appropriate for model evaluation and hypothesis testing, because this is a flexible and strong theory-driven data analytical approach for the evaluation of models and the testing of causal relationships involving latent as well as measurable variables (Mueller and Hancock, 2018; Ullman and Bentler, 2012). The software used for the SEM analyses was SmartPLS4.

Descriptive statistics analyses of the data were conducted using the Mean ( $\bar{x}$ ) and Standard Deviation (SD) techniques. These measures are suitable for estimating values that describe a phenomenon (Tafoya, 2018). The data analysis was performed using the SPSS software, version 25.

Incorporating structural equation modeling (SEM) into the research methodology demonstrates a sophisticated analytical approach. SEM serves as a powerful tool to assess the relationships between variables and test the proposed hypotheses. Specifically, Confirmatory Factor Analysis (CFA) validates the constructs and hypotheses, while path analysis explores the causal connections between variables, in accordance with the guidelines provided by Ullman and Bentler (2012) and Beran and Violato (2010). SEM's flexibility in handling complex relationships and latent constructs makes it suitable for scrutinizing intricate research models and their interrelationships, in line with the insights of Mueller and Hancock (2018) and Ullman and Bentler (2012). The choice of software, such as SmartPLS4, demonstrates a deliberate selection to ensure accurate and efficient SEM analyses. The SmartPLS 4 is a good choice for this study because it is a powerful and flexible tool for analyzing complex models with small sample sizes and non-normal data.

Furthermore, the inclusion of descriptive statistics, such as Mean ( $\bar{x}$ ) and Standard Deviation (SD), contributes to a comprehensive understanding of the data. These statistical measures are appropriately used to summarize the central tendencies and variability within the dataset, echoing the approach advocated by Tafoya (2018). The application of SPSS software, version 25, for data analysis underscores a commitment to using reputable tools in the research process.

Overall, this aspect of the research study underscores the meticulous attention to detail and adherence to best practices in data collection, management, and analysis. By employing a combination of methods like SEM, CFA, and descriptive statistics, the study establishes a strong foundation for drawing meaningful insights and conclusions, ultimately enhancing the study's scholarly rigor and contribution to the field.

### **3.10 Reliability and Validity Test**

Saunders et al. (2009) assert that reliability and validity are two essential characteristics of quantitative research, which demonstrate the quality and rigor of the study design. Hence, research must gather empirical data that accurately reflects circumstances as they occur. Reliability in quantitative research is the consistency and dependability of a measurement tool (Saunders et al., 2009). In other words, reliability refers to the consistency and stability of the results obtained from a research tool when used repeatedly and under similar conditions, regardless of who is administering it or the

characteristics of the participants being studied. The degree of reliability, as defined by Rönkkö and Evermann (2013), assesses the degree of dependability of data collection. The Cronbach alpha test was used to measure the instrument's reliability for the research. According to Cohen (2008), a reliability coefficient of 0.70 or more is regarded as acceptable. In research, having a reliability coefficient of 0.70 or more is important because it indicates that the measurement instrument is producing consistent and stable results, which increases the confidence in the validity of the data collected. Researchers strive for high reliability to ensure that the findings are not due to measurement error, but rather reflect the true characteristics of the variables being studied.

Internal validity ensures that the study's design, methods, and data analysis minimise the effects of extraneous factors and maximize the effect of the intervention or treatment being studied. On the other hand, external validity ensures that the study's results are applicable to other populations, settings, or contexts. Both internal and external validity are important considerations in designing and conducting research studies (Rönkkö and Evermann, 2013). Overall, validity is crucial in ensuring that the data collected in a study are trustworthy and reflect the reality of the phenomenon being studied. Validity has a significant flaw that restricts the study's conclusions because it deals with a limited sample. As a result, this has an impact on the findings since it reduces the likelihood of generalization by failing to offer the study with clear findings that apply to the entire population. Nonetheless, the study's validity was established through pilot testing, questionnaire experts review, and peer review.

By incorporating these rigorous validation measures, the study aimed to mitigate potential threats to internal and external validity and enhance the credibility of its findings. While limitations related to sample size and generalization exist, the steps taken to establish validity through pilot testing, expert review, and peer evaluation contribute to the overall quality and trustworthiness of the research outcomes.

### **3.11 Ethical Considerations**

According to Saunders et al. (2009) an ethical consideration in research is the acceptability of the researchers' conduct with regard to the rights of the participants or respondents in the study. Indeed, ethical considerations are essential when conducting research in the social sciences. Researchers must ensure that all participants provide

voluntary informed consent, which involves explaining the study's purpose, procedures, and risks and benefits to potential participants and giving them the choice to participate or withdraw at any time. They must also guarantee confidentiality by protecting the privacy of participants' personal information and ensuring that data is reported in a way that does not reveal individual identities. Additionally, researchers should take measures to minimise the risk of harm or discomfort to participants, such as avoiding invasive procedures or ensuring appropriate support is in place to deal with any negative consequences of the study. Finally, researchers should ensure that data collected from participants is used appropriately and in accordance with ethical principles (Bryman and Bell, 2015).

Therefore, in this study, every effort was made to ensure that all of these ethical concerns were addressed. In the case of voluntary participation, all responders were permitted to voluntarily participate in the data collection process. Respondents were allowed to complete the surveys on their own, and they were advised to leave blank spaces in the questionnaires for further clarification through a method of their preference should any questions remain unclear. To maintain respondents' anonymity, the questionnaire did not allow them to provide their names or phone numbers. As a result, participants were guaranteed that neither their personal information nor that of the study participants would be disclosed to the public. The study maintained information confidentiality by ensuring respondents that all information submitted would be kept private. To avoid an ethical problem of plagiarism, all relevant information gathered for the study was properly referenced.

### **3.12 Profile of Study Area**

This study was conducted with an emphasis on Ghana's industrial sector. Specifically on some selected manufacturing, agricultural/agribusiness, mining/extraction, and logistics/transportation sectors in Ghana. The Ghana Statistical Service reports that Ghana's industrial sector contributed around 25.9% of the country's GDP in 2011 and generated a net value of nearly US\$ 9.5 billion (World Bank, 2013).

Currently, there are five subsectors within the industrial sector in Ghana, specifically, manufacturing, building, mining and quarrying, power, and water and sewage (Turkson et al., 2014). According to Kolavalli et al. (2012) Ghana's socioeconomic development is seen to be significantly propelled by the manufacturing sector, because of its

economic connections to the other key sectors, including agriculture, mining and extractive industries, and services. Ghana's manufacturing operations include, among other things, the production of food, beverages, tobacco, textiles, and cement (Turkson et al., 2014). The construction industry is involved in building, repairing, maintaining, altering, and demolishing structures, streets, bridges, roads, sewers, trains, and communication systems (Turkson et al., 2014). Extraction of natural minerals in their various states, such as solids, liquids, and gases, is a part of the mining and quarrying sector. (Turkson et al., 2014).

The industrial sector in Ghana heavily relies on petroleum products and electricity, leading to high energy consumption and environmental pollution, which adversely affects the environment and public health. As a result, there have been calls from stakeholders for companies in the sector to adopt more eco-friendly practices to mitigate these negative externalities (Agyabeng-Mensah et al., 2020).

The study concentrated on firms in Ghana's northern and southern sectors because, according to an analysis of the regional distribution of businesses in Ghana, the southern sector and northern sector comprised the majority of industrial establishments (GSS, 2013). Considering that these zones make up about 70% of the entire industrial distribution in Ghana (GSS, 2006), approximately 30% of the total number of establishments were also in the Eastern and Western sectors combined (GSS, 2006). This demonstrates their important contributions to the development of Ghana's industrial sector.

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS, AND DISCUSSION OF RESULTS

#### 4.1 Introduction

This chapter presents the results of the study that aimed to investigate the impact of environmental training on green logistics management practices through supplier environmental orientation, with the moderating effects of top management commitment and corporate environmental orientation. The chapter covers various aspects, including response rate, demographic characteristics of participants, reliability and validity tests, descriptive statistics, model and hypothesis testing, and the discussion of the obtained results. The findings of the study are crucial in advancing the understanding of the topic under investigation. The Discussion of Results section provides an in-depth analysis of the study's findings in the context of the reviewed literature. The data analysis was carried out using SmartPLS4.

#### 4.2 Response Rate

In this study, 300 questionnaires were distributed, of which 290 completed questionnaires were received, yielding an impressive 96.7% response rate. The inclusion of 290 responses out of the 300 distributed questionnaires provides a substantial and robust sample size, facilitating the application of statistical methods with sufficient power. Given that the sample size meets the requirements for precision and confidence levels, it can be deemed suitable for analysis. The sufficient sample size effectively minimises sampling errors and enhances the likelihood of generating outcomes that accurately represent the target population. Overall, the researcher's efforts in ensuring a high response rate and securing an adequate sample size appear commendable, crucially contributing to the credibility and soundness of the research endeavour.

#### 4.3 Demographic Profile of the Respondents

This section provides a detailed explanation of the demographic characteristics of the respondents, including their gender, age, educational background, ownership type, number of employees, and company age, position within the organisation, and

experience in their role. Understanding the demographic characteristics of the sample respondents is crucial to gain a complete understanding of the social and economic context in which a research study is conducted. By doing so, it helps to identify patterns, trends, and relationships between various variables, which can have an impact on the explanation and discussion of the findings. In this section, the study presented a detailed breakdown of each demographic variable. The study also discussed the significance of these findings and how they relate to the research objectives and hypotheses.

**Table 4.1: demographic of respondents**

<b>Variables</b>		<b>Frequency</b>	<b>Valid Percentage</b>
<b>Gender</b>	Male	160	55.2
	Female	130	44.8
<b>Age</b>	20 to 30	53	18.3
	31 to 40	145	50.0
	41 to 50	71	24.5
	50 and above	21	7.2
<b>No. of years in the firm</b>	0-5 years	52	17.9
	6-10 years	75	25.8
	11-15 years	57	19.7
	Above 15 years	106	36.6
<b>Educational Level</b>	Diploma/HND	63	21.7
	Bachelor's Degree	92	31.7
	Masters' Degree	124	42.8
	Ph.D./Doctorate	11	3.8
<b>Managerial Level</b>	Top Manager	153	57.8
	Middle Manager	83	28.6
	Lower Manager	54	18.6
<b>Position</b>	Supply Chain Manager	103	35.5
	Logistics Manager	62	21.4
	Operations Manager	71	24.5
	Chief Executive Officer	24	8.3
	Managing Director	30	10.3
<b>Number of years in your Managerial Level</b>	Less than 5 years	52	17.9
	6 to 10 years	49	16.9
	11 to 15 years	69	23.8
	16 to 20 years	79	27.2
	Above 20 years	41	14.1

<b>Firm's Industry</b>	Logistics/Transportation	71	24.6
	Mining/Extraction	68	23.4
	Agricultural/Agribusiness	54	18.6
	Manufacturing	97	33.4
<b>Type of Ownership</b>	Fully Locally Owned	95	32.8
	Fully Foreign Owned	89	30.7
	Jointly Ghanaian and Foreign	106	36.5
<b>Number of years of the firm's existence</b>	Less than 1 year	11	3.8
	1-5 years	52	17.9
	6-10 years	49	16.9
	11-15 years	41	14.1
	16-20 years	68	23.4
	Above 20 years	69	23.7
<b>Number of employees</b>	Less 100 employees	62	21.3
	101-200 employees	71	24.5
	201-300 employees	57	19.7
	301-400 employees	36	12.4
	401-500 employees	42	14.5
	501-1000 employees	22	7.6
<b>Firm Location</b>	Southern sector	165	56.9
	Northern sector	125	43.1

**Source: Field data, 2023**

#### **4.3.1 Gender of Respondents**

Out of the 290 sample respondents, 160 of them, representing 55.2% are males while 130 respondents, representing 44.8% are females. This finding suggests that, more men than women participated in the study, Of course, considering the nature of the job description. The proportionate difference in the responses is also recognised as insignificant and unbiased, making it justifiable to be used for the analysis.

#### **4.3.2 Age of Respondents**

With a sample size of 290 respondents, 53 of them representing 18.3% are between 20-30 years; 145 respondents, representing 50 % are between 31-40 years; 71 respondents, or 24.5% are between 41 and 50 years while 21 respondents representing 7.2% are 50 years and above. This finding suggests that there is a good representation from all age groups, so the responses are assumed to be evenly distributed throughout the age categories. The age distribution of the respondents, as described, indicates that

individuals under the age of 20 were excluded from the study. This deliberate exclusion of respondents younger than 20 years old helps ensure that the sample is comprised of individuals who are beyond the youthful age range, thereby aligning with the research's focus and objectives.

#### **4.3.3 Number of years worked with the firm**

Out of the total 290 responses, 52 respondents reported having less than five years of work experience with their firms, accounting for (17.9%). Additionally, 57 respondents (25.8%) reported having worked with their firms for 6-10 years, while another 57 respondents (19.7%) reported having worked with their firms for 11-15 years. The majority of the respondents, 106 (36.6%), reported having worked with their firms for more than 15 years. This suggests that most respondents have been working with their respective firms for quite some times now, hence, have gained enough work experience. This, therefore, shows that the responses provided by the respondents can therefore be viewed as a true reflection of what is going on in the organisations.

#### **4.3.4 Educational Background**

Out of 290 responses, 63 respondents consisting of 21.7% have diploma/HND certificates; 92 of them, representing 31.7% have a bachelor's degree and 124 respondents, representing 42.8 % have a Master's degree while 11 responses 3.8 % have Ph.D./Doctorate. This result suggests that most respondents have the sufficient cognitive ability to comprehend the requirements of the study's questionnaire, and as a result, their responses can once more be accepted as an accurate representation of what is relevant within the organisations.

#### **4.3.5 Managerial Level**

From the sample size of 290 respondents, 153 respondents, representing 57.8% are top managers; 83 respondents, representing 28.6 % are middle managers; and 54 respondents, representing 18.6% are lower managers. The outcome demonstrates that the respondents are key players and essential to firms' operations.

#### **4.3.6 Position Held by Respondents**

Out of the 290 responses, 103 respondents, representing 35.5 % are Supply Chain Managers; 62 of them, or 21.4% are Logistics Managers; 71 respondents, representing 24.5% are Operation Managers; 24 of them are Chief Executive Officers while 30 respondents are Managing Director. Since these people are involved in making strategic decisions, the study could then suggest that the responses are genuine and reliable.

#### **4.3.7 Number of years in your Managerial Level**

Among the 290 responses obtained, 52 participants (17.9%) reported having less than five years of experience in a managerial position, while 49 (16.9%) reported being in the position for 6-10 years. Additionally, 69 respondents (23.8%) reported holding the position for 11-15 years, while 79 (27.2%) reported having 16-20 years of experience. Furthermore, 41 respondents (14.1%) reported having over 20 years of experience in a managerial position.

#### **4.3.8 Firms' Industry**

The majority of the firms in the sample operate in the manufacturing industry (33.4%), followed by the logistics/transportation industry (24.6%), followed by the mining/extraction industry (23.4%), and then followed by agro-business industry (18.6%). This indicates that the sample is largely made up of firms in the manufacturing sector.

#### **4.3.9 Type of Ownership**

The data shows that 95 respondents, representing 32.8 percent fully locally owned while 89 (30.7%) are fully foreign-owned, and 106 respondents, representing 36.5% are jointly Ghanaian and foreign-owned firms. This suggests that the sample is representative of a diverse range of ownership structures.

#### **4.3.10 Number of years of firm existence**

The table above presents the distribution of the number of years that the firms have existed. Most of the firms have been in existence for more than 20 years, with 23.7%, also, 23.4% falls in the 16–20-year range. Again, 17.9% falls in the 1-5 years range, followed by 16.9% between the 6-10 years while 14.1% also falls within 11-15 years. The smallest proportion of firms, at 3.7%, has been in existence for less than a year.

This implies that the study is focused on established firms rather than start-ups, which may have implications for the generalisability of the findings.

#### **4.3.11 Number of employees**

Out of 290 respondents, 21.3% of the firms have a labour force of fewer than 100 employees; other firms have 101-200 employees, representing 24.5%; other firms have between 201-300 employees, representing 19.7%; again, firms have employed between 301-400 employees, representing 12.4%; firms with 401-500 employees, representing 14.5%; while a section of the firms has between 501-1000 employees, representing 7.6%.

#### **4.3.12 Firm Location**

Based on the sample of 290 respondents, the findings indicate that 56.9% of the participants, which is equivalent to 165 respondents, are situated in the southern part of Ghana. On the other hand, 43.1% of the respondents, which is equivalent to 125 participants, are located in the northern part of Ghana. The results suggest that the sample respondents are distributed across the country, which enhances the study's reliability and generalisability.

### **4.4 Descriptive Statistics**

The score of each variable used to measure the five primary study constructs is reported using descriptive statistics. The Likert scale, which ranges from 1 to 7, was used to measure how much agreement there was, and the score is compared to the scale to determine how frequently the indicators of the variables occur in the various companies.

On a scale ranging from 1 to 7, the following constructs are described in detail, with corresponding values assigned to each level of agreement or disagreement: 1-1.99 representing "strongly disagree," 2.0-2.49 representing "disagree," 2.50-2.99 representing "somewhat disagree," 3.0-3.99 representing "not sure," 4.0-4.99 representing "somewhat agree," 5.0-5.99 representing "agree," and 6.0-7.0 representing "strongly agree."

#### 4.4.1 Environmental Training

This section describes the extent and nature of environmental training implemented by firms in the study. Table 4.2 below presents the results.

**Table 4.2: Descriptive Statistics Results for Environment Training**

Code	Items	Mean	SD	Skewness	Kurtosis
ET 1	The contents of Environmental Training (ET) are raised through a systematic analysis of training gaps and needs	4.82	2.051	-.486	-1.273
ET 2	The responsibilities and duties of official environmental trainers are precisely defined	4.91	2.164	-.735	-.997
ET 3	Participants who receive Environmental Training (ET) have many opportunities to apply the acquired environmental knowledge	4.60	2.049	-.572	-1.096
ET 4	There is an adequate infrastructure (physical space, material, people) for the delivery of Environmental Training (ET)	4.74	1.991	-.698	-.926
ET 5	Environmental Training (ET) sessions occur within the company	4.89	2.053	-.691	-1.007
ET 6	Environmental Training (ET) sessions occur outside of the company	4.87	2.030	-.720	-.930
ET 7	There are adequate performance assessments after attending Environmental Training (ET) sessions	4.58	2.006	-.555	-1.049
ET 8	The topics discussed during Environmental Training (ET) are appropriate and current for company activities	4.56	2.012	-.542	-1.075
ET 9	Environmental Training (ET) helps to enhance the operations of the organisation	4.63	2.008	-.569	-1.103
ET 10	Generally, participants are satisfied with the Environmental Training (ET) programs offered	4.66	2.056	-.588	-1.117
	<b>Composite Score</b>	<b>4.73</b>	<b>2.042</b>	<b>-0.616</b>	<b>-0.965</b>

**Source: Field data, 2023**

The data presented in this section pertains to the results of a survey aimed at assessing the effectiveness of Environmental Training (ET) initiatives implemented by the firms. Respondents rated each of the 10 items on a 7-point scale, where higher scores indicate a more favourable response. Based on the data, the following can be observed:

Overall, the mean score for the 10 items is 4.73, indicating a slightly positive response to the Environmental Training programs.

The standard deviation is relatively high at 2.042, which suggests a wide range of responses from the participants. The skewness of -0.616 indicates a slightly negative skew, meaning that the distribution is slightly skewed to the left. The kurtosis of -0.965 indicates a platykurtic distribution, which means that the distribution is flatter than a normal distribution.

Upon examining the individual survey items, it is apparent that item ET 2 received the highest mean score, indicating that there is a clear and specific definition of the roles and responsibilities of official environmental trainers. On the other hand, the lowest mean score was attributed to item ET 8, indicating that some participants believe that the environmental topics discussed during training may not be relevant or up-to-date for the firm's activities.

Overall, the composite score suggests that the Environmental Training programs within the company are perceived positively, but there may be some areas that could be improved. Specifically, the company may want to review the topics discussed during the training sessions to ensure that they are relevant and current to company activities. The company may also want to consider providing more opportunities for participants to apply the acquired environmental knowledge, as well as ensuring that there are adequate performance assessments after attending training sessions.

#### 4.4.2 Supplier Environmental Orientation (SEO)

This section describes the extent and nature of supplier environmental orientation. The results are therefore presented in Table 4.3 below.

**Table 4.3: Descriptive Statistics Results for Supplier Environmental Orientation**

Code	Items	Mean	SD	Skewness	Kurtosis
SEO 1	Our firm exerts concerted efforts to allow each supplier to understand the importance of environmental preservation.	5.05	1.982	-.736	-.892
SEO 2	Our firm requests potential primary suppliers to provide evidence of all environmental licenses and permits	4.76	2.021	-.773	-.791
SEO 3	Our firm requests potential primary suppliers to have implemented environmental management systems (e.g., ISO 14001)	4.77	1.951	-.686	-.926
SEO 4	Our firm has environmental specialists who audit potential primary suppliers' plants	4.99	2.092	-.845	-.802
SEO 5	Our firm sends environmental questionnaires to existing primary suppliers to monitor their compliance.	4.70	1.995	-.707	-.907
SEO 6	Our firm asks existing primary suppliers to commit to waste reduction goals.	4.82	2.040	-.748	-.883
SEO 7	Our firm has environmental criteria for periodic evaluation of existing primary suppliers.	4.79	1.975	-.707	-.842
SEO 8	We achieve our environmental goals collectively with our main Suppliers	4.92	1.982	-.786	-.743
SEO 9	Our main suppliers exchange information with us to improve environmental performance.	4.75	1.923	-.726	-.742
SEO 10	Our organisation asks suppliers to reduce packaging materials	4.91	2.015	-.820	-.758
<b>Composite Score</b>		<b>4.85</b>	<b>1.998</b>	<b>-0753</b>	<b>-0.736</b>

**Source: Field data, 2023**

The table provides the descriptive statistics results for the Supplier Environmental Orientation (SEO) practices of a company. The data contains the mean, standard deviation, skewness, and kurtosis values for each of the 10 items, as well as the composite score, which is the average score across all items. The interpretation of the results is as follows:

The mean scores range from 4.70 to 5.05, the results suggest that the participants hold a slightly positive perception of the company's Supplier Environmental Orientation practices. The standard deviations range from 1.923 to 2.092, suggesting that there is some variability in participants' responses. The range of skewness values for the items is from -0.845 to -0.686, indicating a slightly negative skew for most of the items. This suggests that the distribution of responses is slightly skewed to the left. The kurtosis values range from -0.926 to -0.742, indicating a platykurtic distribution for all items, which means that the distribution is flatter than a normal distribution.

When looking at the composite score, is 4.85, which is slightly above the midpoint of the 7-point scale. This indicates that the company's Supplier Environmental Orientation practices are perceived positively, but there is room for improvement.

The highest mean score is for item SEO 1, the results suggest that the company makes concerted efforts to ensure that each supplier understands the importance of environmental preservation. However, the lowest mean score was obtained for item SEO 5, indicating that the company may not always send environmental questionnaires to existing primary suppliers to monitor their compliance.

Based on the results, the company may want to consider implementing more rigorous practices to monitor compliance with its environmental criteria. Specifically, it could consider implementing periodic evaluations of existing primary suppliers and requesting potential primary suppliers to provide evidence of all environmental licenses and permits. Additionally, the company could increase its efforts to exchange information with its main suppliers to improve environmental performance. Finally, the company could ensure that environmental questionnaires are sent to all existing primary suppliers to monitor their compliance

#### 4.4.3 Green Logistics Management Practices (GLMPs)

This section describes the extent and nature of green logistics practices. The results are therefore presented in Table 4.4 below.

**Table 4.4: Descriptive Statistics Results for Green Logistics Management Practices**

Code	Items	Mean	SD	Skewness	Kurtosis
GLMPS 1	We consider environmental matters generally in our transport decisions	4.85	2.055	-.591	-1.147
GLMPS 2	We practice reduce, reuse, and recycle	4.91	2.113	-.727	-.974
GLMPS 3	We Promote the use of ecological materials for inner and outer packaging.	4.70	2.072	-.644	-1.096
GLMPS 4	We ensure enhanced sharing of environmental information across our logistics network	4.63	2.029	-.636	-1.022
GLMPS 5	We use sustainable transport methods to reduce CO2 emissions.	4.71	2.034	-.642	-.998
GLMPS 6	We plan the routes of our vehicles in order to reduce environmental impact.	4.81	2.036	-.659	-1.024
GLMPS 7	We have invested in vehicles that are designed to have reduced environmental impacts.	4.61	1.980	-.577	-1.052
GLMPS 8	We cooperate with suppliers and customers to develop route networks	4.76	2.015	-.712	-.871
GLMPS 9	We collect used products for recycling	4.94	2.018	-.718	-.933
GLMPS 10	Our organisation buys from local suppliers to reduce transportation-related pollution	4.82	2.042	-.757	-.891
<b>Composite Score</b>		<b>4.77</b>	<b>2.45</b>	<b>-0.666</b>	<b>-1.001</b>

Source: Field data, 2023

The table presents the descriptive statistics results for the Green Logistics Management Practices (GLMPS) of a company. The data includes the mean, standard deviation, skewness, and kurtosis values for each of the 10 items, as well as the composite score, which is the average score obtained by combining the scores of all items. The interpretation of the results is as follows:

The results show that the mean scores for the Green Logistics Management Practices (GLMPS) range from 4.61 to 4.94, indicating that the participants have a slightly positive perception of the company's practices in this area. The standard deviations range from 1.980 to 2.113, suggesting that there is some variability in participants' responses. The skewness values range from -0.757 to -0.577, indicating a slightly negative skew for most of the items, which means that the distribution of responses is slightly skewed to the left. The kurtosis values range from -1.147 to -0.871, indicating a platykurtic distribution for all items, which means that the distribution is flatter than a normal distribution. When looking at the composite score, is 4.77, which is slightly above the midpoint of the 7-point scale. This indicates that the company's Green Logistics Management Practices are perceived positively, but there is room for improvement.

The highest mean score is for item GLMPS 9, which suggests that the company collects used products for recycling. The item with the lowest mean score is GLMPS 3, which suggests that the company may not always promote the use of ecological materials for inner and outer packaging.

According to the findings, the company should consider adopting more stringent measures to encourage the use of eco-friendly materials for both inner and outer packaging. Moreover, it is advisable to invest in greener vehicles and improve the sharing of environmental knowledge across its logistics network. The company can also intensify its collaboration with suppliers and customers to develop route networks and use sustainable transportation methods to reduce CO<sub>2</sub> emissions. Finally, purchasing from local suppliers could be considered as an option to minimise pollution related to transportation.

#### 4.4.4 Top Management Commitment (TMC)

This section describes the extent and nature of top management commitment. The results are presented in Table 4.5 below.

**Table 4.5: Descriptive Statistics Results for Top Management Commitment**

Code	Items	Mean	SD	Skewness	Kurtosis
TCM 1	Top management in our organisation considers environmentally sustainable practices as a vital part of corporate strategy	4.56	1.986	-.469	-1.184
TCM 2	Top management at our company treats environmental protection as an important issue.	4.46	2.058	-.526	-1.126
TCM 3	Preserving the environment is a central corporate value in our organisation	4.66	2.092	-.607	-1.126
TCM 4	Top management at our company ensures that employees understand the importance of environmental preservation	4.70	1.929	-.574	-1.021
TCM 5	Top management allocates sufficient resources to implement environmental projects	4.58	2.079	-.565	-1.128
TCM 6	Top managers support efforts to develop environmental management practices	4.77	2.049	-.586	-1.124
TCM 7	Top management at our company follows up on suggestions for improvement in environmental protection.	4.72	2.018	-.642	-1.016
<b>Composite Score</b>		<b>4.64</b>	<b>2.030</b>	<b>-0.567</b>	<b>-1.103</b>

**Source: Field data, 2023**

The table presents descriptive statistics results for Top Management Commitment (TCM) in terms of mean, standard deviation (SD), skewness, and kurtosis. The composite score for TCM is also provided.

The results indicate that the mean score for each item in the TCM (Top Management Commitment) construct is relatively high, ranging from 4.46 to 4.77 on a 7-point Likert scale. This suggests that respondents generally have a positive perception of the company's top management commitment to environmental sustainability. The composite score for the TCM construct is also relatively high at 4.64, which suggests a

high level of perceived top management commitment to environmental sustainability across all items.

The standard deviation values range from 1.929 to 2.092, indicating some variability in responses across the sample for each item. However, these values are not overly high and suggest a relatively consistent perception of top management commitment to environmental sustainability among the sample.

The skewness values for each item range from -0.469 to -0.642 and the composite score is -0.567. These values are all negative, indicating that the data is skewed to the left, with more responses toward the higher end of the scale. This suggests that respondents generally perceive top management's commitment to environmental sustainability positively.

The kurtosis values for each item range from -1.184 to -1.016 and the composite score is -1.103. These values are all negative, indicating that the data is platykurtic, i.e., less peaked and flatter than a normal distribution. This suggests that the responses are spread out more than they would be in a normal distribution.

In summary, the results suggest that respondents generally perceive top management's commitment to environmental sustainability positively across all items. The data is slightly skewed to the left and is platykurtic, indicating some variability in responses, but overall, and respondents view top management's commitment to environmental sustainability as high.

#### 4.4.5 Corporate Environmental Orientation (CEO)

Here, the results for the extent of corporate environmental orientation are presented in Table 4.6 below.

**Table 4.6 Descriptive Statistics Results for Corporate Environmental Orientation**

Code	Items	Mean	SD	Skewness	Kurtosis
CEO 1	Our organisation has a clear policy statement on environmental awareness in every area.	4.77	2.006	-.617	-1.032
CEO 2	Preserving the environment is a central corporate value in our organisation	4.86	2.063	-.730	-.895
CEO 3	Environmental preservation is vital to our organisation's survival	4.86	1.984	-.748	-.808

CEO 4	Our organisation's responsibility to the environment is of greater importance than the responsibility to its stakeholders	4.74	1.997	-.685	-.905
CEO 5	Our organisation has a responsibility to preserve the environment	4.78	1.932	-.729	-.817
CEO 6	Environmental preservation is a high-priority activity in our organisation	4.89	2.032	-.833	-.729
<b>Composite Score</b>		<b>4.82</b>	<b>2.003</b>	<b>-0.724</b>	<b>-0.864</b>

**Source: Field data, 2023**

The table presents descriptive statistics results for Corporate Environmental Orientation (CEO) in terms of mean, standard deviation (SD), skewness, and kurtosis. The composite score for CEO is also provided.

The results indicate that the mean score for each item in the CEO (Corporate Environmental Orientation) construct is relatively high, ranging from 4.74 to 4.89 on a 7-point Likert scale. This suggests that respondents generally have a positive perception of the organisation's environmental orientation. Additionally, the composite score for CEO is also relatively high at 4.82, which suggests a high level of perceived environmental orientation across all items.

The standard deviation values range from 1.932 to 2.063, indicating some variability in responses across the sample for each item. However, these values are not overly high and suggest a relatively consistent perception of the organisation's environmental orientation among the sample.

The skewness values for each item range from -0.617 to -0.833 and the composite score is -0.724. These values are all negative, indicating that the data is skewed to the left, with more responses toward the higher end of the scale. This suggests that respondents generally perceive the organisation's environmental orientation positively.

The kurtosis values for each item range from -1.032 to -0.729 and the composite score is -0.864. These values are all negative, indicating that the data is platykurtic, i.e., less peaked and flatter than a normal distribution. This suggests that the responses are spread out more than they would be in a normal distribution.

In summary, the results suggest that respondents generally perceive the organisation's environmental orientation positively across all items. The data is slightly skewed to the left and is platykurtic, indicating some variability in responses, but overall, and respondents view the organisation's environmental orientation as high.

#### **4.5 Inferential Statistics**

Inferential statistics involves using statistical methods to make conclusions and inferences about a larger population based on the analysis of a smaller sample of data, as stated by Agresti and Finlay (2018). This is done by estimating population parameters such as means and proportions.

Hogg et al. (2018) explained that hypothesis testing is a widely used inferential statistical method. It involves establishing both null and alternative hypotheses, gathering data, computing test statistics, and assessing the likelihood of obtaining the observed test statistic under the null hypothesis. Rejecting the null hypothesis and supporting the alternative hypothesis is done when the computed probability value, commonly referred to as the p-value, is less than a predetermined level of significance.

Confidence interval estimation is a commonly used inferential statistical method. It involves calculating a range of values, known as a confidence interval, for a population parameter based on a sample statistic and a predetermined level of confidence. This range provides a plausible estimate of the true value of the population parameter with a certain level of confidence. For instance, a 95% confidence interval for a population mean would include a range of values that are expected to capture the true population mean with 95% confidence.

Inferential statistics can be used in a variety of fields, including business, social sciences, medicine, and engineering, to make informed decisions and draw conclusions about populations based on sample data (Walpole et al., 2018). It is crucial to ensure that the sample selected for inferential statistics is an accurate representation of the larger population being studied. Additionally, using appropriate statistical methods that address the research question at hand is crucial.

#### 4.5.1 Test for Normality

Normality statistics are utilised to check whether a particular data set conforms to a normal distribution, which is a graph that is bell-shaped, with the majority of the observations situated around the mean, and the graph being symmetrical around the mean. Normality is important in many statistical analyses because several statistical methods, such as t-tests and ANOVA, require normality assumptions to be met. Normality statistics are important because if a data set is not normally distributed, it can lead to incorrect inferences and conclusions. Therefore, it is essential to check normality before conducting any statistical analysis that assumes normality.

**Table 4.7: Descriptive and Normality Statistics**

Construct	Mean	Std. Deviation	Kurtosis	Skewness
Environmental Training	4.73	1.862	-0.282	-0.738
Supplier Environmental Orientation	4.85	1.815	-0.679	0.606
Green Logistics Management Practices	4.78	1.841	-0.243	0.763
Top Management Commitment	4.63	1.840	-0.290	-0.703
Corporate Environmental Orientation	4.82	1.831	-0.657	0.900

**Source: Field data, 2023**

The table provides descriptive statistics, including the mean and standard deviation, and normality statistics, such as skewness and kurtosis, for five constructs: Environmental Training, Supplier Environmental Orientation, Green Logistics Management Practices, Top Management Commitment, and Corporate Environmental Orientation.

The mean scores for each construct range from 4.63 to 4.85, indicating that respondents perceive these constructs positively overall. The range of standard deviations across the constructs is from 1.815 to 1.862, indicating that the responses for each construct vary to some extent.

The normality statistics show that the skewness values for each construct range from -0.738 to 0.900, indicating that the data is slightly skewed to the left or right. The kurtosis values for each construct range from -0.679 to -0.243, indicating that the data is mesokurtic, meaning that it is neither excessively peaked nor flat relative to a normal distribution.

Overall, the descriptive statistics suggest that respondents generally perceive the constructs positively, while the normality statistics indicate that the data is reasonably normally distributed, except for the Supplier Environmental Orientation construct, which exhibits some positive skewness and negative kurtosis. This finding suggests that parametric tests may be appropriate for analysing the data, although caution should be exercised when interpreting results for constructs that exhibit some skewness and kurtosis.

#### **4.5.2 Harman's Single Factor Test**

Harman's Single Factor Test serves as a widely employed statistical tool to identify common method variance (CMV) within datasets. This method involves subjecting a set of variables, assumed to measure distinct constructs, to factor analysis. In instances of CMV, this analysis yields a solitary factor that significantly accounts for variance across the dataset.

The findings highlight that the first component explains 32.706% of the total variance, being the only component with an eigenvalue surpassing 1. This observation hints at possible CMV presence, given the substantial variance capture by the first component compared to others.

Nonetheless, it is crucial to acknowledge that the dominance of variance explained by the first component is not overwhelming. Several other components also contribute significantly to variance, indicating that potential CMV is not the exclusive driver of the dataset's variability.

In summary, the PCA outcomes suggest a likelihood of some CMV presence, signalled by the notable variance accounted for by the first component. Nevertheless, the influential role played by numerous other components in explaining variance implies that CMV isn't the solitary governing factor influencing the dataset.

#### **4.5.3 Collinearity Test**

Collinearity is a phenomenon where there is a strong correlation between two or more independent variables in a regression analysis, as defined by Vatcheva et al. (2016). It can create challenges in regression analysis such as increased standard errors, unstable coefficients, and decreased predictive power of the model. However, it is important to

note that not all types of analyses and data require collinearity tests. The appropriate method for testing collinearity will depend on the specific research question and the data being analysed.

**Table 4.8: Collinearity Test**

	CEO	ET	GLMP	SEO	TMC	TMC x ET	CEO x ET
CEO			1.11				
ET			1.17	1.21			
GLMP							
SEO			1.12				
TMC				1.19			
TMC x ET				1.1			
CEO x ET			1.05				

**Source: Field data, 2023**

Table 4.8 presents the outcomes of a collinearity analysis that examined the independent variables utilised in the research. The table exhibits the variance inflation factor (VIF) for every combination of independent variables, as well as the interaction between top management commitment (TMC) and environmental training (ET), and the interaction between CEO and environmental training (ET). The findings imply that there is no significant collinearity among the independent variables or their interaction terms, as all VIF values are much below the threshold of 10. These results suggest that the independent variables are not highly correlated with each other, and there is no multicollinearity issue in the dataset.

**Table 4.9: Exploratory Factor Analysis (EFA)**

Items	ET	SEO	GLMPS	TMC	CEO
1. The contents of Environmental Training (ET) are raised through a systematic analysis of training gaps and needs	<b>.812</b>				
2. The responsibilities and duties of official environmental trainers are precisely defined	<b>.834</b>				
3. Participants who receive Environmental Training have many opportunities to apply the acquired environmental knowledge	<b>.830</b>				
4. There is an adequate infrastructure for the delivery of Environmental Training (ET)	<b>.852</b>				

5. Environmental Training (ET) sessions occur within the company	<b>.840</b>			
6. Environmental Training (ET) sessions occur outside of the company	<b>.842</b>			
7. There are adequate performance assessments after attending Environmental Training sessions	<b>.834</b>			
8. The topics discussed during Environmental Training are appropriate and current for company activities	<b>.824</b>			
9. Environmental Training (ET) helps to enhance the operations of the organisation	<b>.845</b>			
10. Generally, participants are satisfied with the Environmental Training (ET) programs offered;	<b>.828</b>			
1. Our firm exerts concerted efforts to allow each supplier to understand the importance of environmental preservation.		<b>.827</b>		
2. Our firm request potential primary suppliers to provide evidence of all environmental licenses and permits		<b>.843</b>		
3. Our firm request potential primary suppliers to have an implemented environmental management system		<b>.831</b>		
4. Our firm has environmental specialists who audit potential primary suppliers' plants		<b>.856</b>		
5. Our firm sends environmental questionnaires to existing primary suppliers to monitor their compliance.		<b>.839</b>		
6. Our firm has environmental criteria for periodic evaluation of existing primary suppliers.		<b>.843</b>		
7. Our firm asks existing primary suppliers to commit to waste reduction goals		<b>.811</b>		
8. We achieve our environmental goals collectively with our main Suppliers		<b>.825</b>		
9. Our main suppliers' exchange information with us to improve environmental performance.		<b>.808</b>		
10. Our organisation asks suppliers to reduce packaging materials		<b>.798</b>		
1. We consider environmental matters generally in our transport decisions			<b>.825</b>	
2. We practice reduce, reuse and recycle			<b>.834</b>	
3. We Promote the use of ecological materials for inner and outer packaging.			<b>.854</b>	
4. We ensure enhanced sharing of environmental information across our logistics network			<b>.819</b>	

5. We use sustainable transport methods to reduce CO2 emissions.			<b>.833</b>		
6. We plan the routes of our vehicles in order to reduce environmental impact.			<b>.825</b>		
7. We have invested in vehicles that are designed to have reduced environmental impacts.			<b>.808</b>		
8. We cooperate with suppliers and customers to develop route networks			<b>.815</b>		
9. We collect used products for recycling			<b>.833</b>		
10. Our organisation buys from local suppliers to reduce transportation related pollution			<b>.746</b>		
1. Top management in our organisation considers environmentally sustainable practices				<b>.796</b>	
2. Top management at our company treats environmental protection as an important issue.				<b>.843</b>	
3. Preserving the environment is a central corporate value in our organisation				<b>.868</b>	
4. Top management at our company ensures that employees understand the importance of environmental preservation				<b>.851</b>	
5. Top management allocates sufficient resources to implement environmental projects				<b>.798</b>	
6. Top managers support efforts to develop environmental management practices				<b>.844</b>	
7. Top management at our company follows up on suggestions for improvement on environmental protection.				<b>.774</b>	
1. Our organisation has a clear policy statement on environmental awareness in every area.					<b>.803</b>
2. Preserving the environment is a central corporate value in our organisation					<b>.872</b>
3. Environmental preservation is vital to our organisation's survival					<b>.850</b>
4. Our organisation's responsibility to the environment is of greater importance than the responsibility to its stakeholders					<b>.851</b>
5. Our organisation has a responsibility to preserve the environment					<b>.846</b>
6. Environmental preservation is a high-priority activity in our organisation					<b>.811</b>

**Source: Field data, 2023**

The table displays the outcome of an exploratory factor analysis (EFA) carried out on the questions related to five constructs: Environmental Training (ET), Supplier Environmental Orientation (SEO), Green Logistics Management Practices (GLMPS), Top Management Commitment (TMC), and Corporate Environmental Orientation (CEO). The table shows the factor loadings for each item, which measures the degree of correlation between the item and the factor it is linked to. A higher factor loading indicates a stronger relationship between the item and the factor.

The results of the exploratory factor analysis (EFA) revealed that all items in the Environmental Training (ET) construct have factor loadings above 0.8, indicating a strong correlation with the underlying factor. Likewise, all items in the Supplier Environmental Orientation (SEO) construct, except for item 10, have factor loadings above 0.8, with item 10 having a slightly lower factor loading of 0.798. This suggests that item 10 may not be as strongly associated with the other SEO items as it is with another construct.

The EFA outcomes lend support to the convergent validity of the measures, given that the items for each construct are highly correlated with one another and load onto the same underlying factor. The findings also suggest that the measures possess good internal consistency, as they all assess the same construct and generate consistent results.

**Table 4.10 KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.951
Bartlett's Test of Sphericity	Approx. Chi-Square	15565.762
	Df	903
	Sig.	.000

**Source: Field data, 2023**

The KMO measure is employed to evaluate the suitability of data for factor analysis, with a score ranging from 0 to 1. Higher scores indicate that the data is better suited for factor analysis. In this case, the KMO value is 0.951, indicating that the data is highly suitable for factor analysis.

Bartlett's Test of Sphericity is a statistical technique used to assess the suitability of data for factor analysis by measuring the strength of the correlations between variables in the dataset. A significant result (p-value less than 0.05) suggests that the correlations between variables are strong enough to conduct factor analysis. In this instance, the p-value is less than 0.001, indicating a highly significant result, which implies that the correlations between the variables are sufficiently strong to proceed with factor analysis.

To summarise, both the KMO measure and Bartlett's Test of Sphericity suggest that the dataset used in this analysis is appropriate for factor analysis.

## 4.6 Evaluation of Partial Least Squares-SEM Results

### 4.6.1 Assessment of Measurement Model

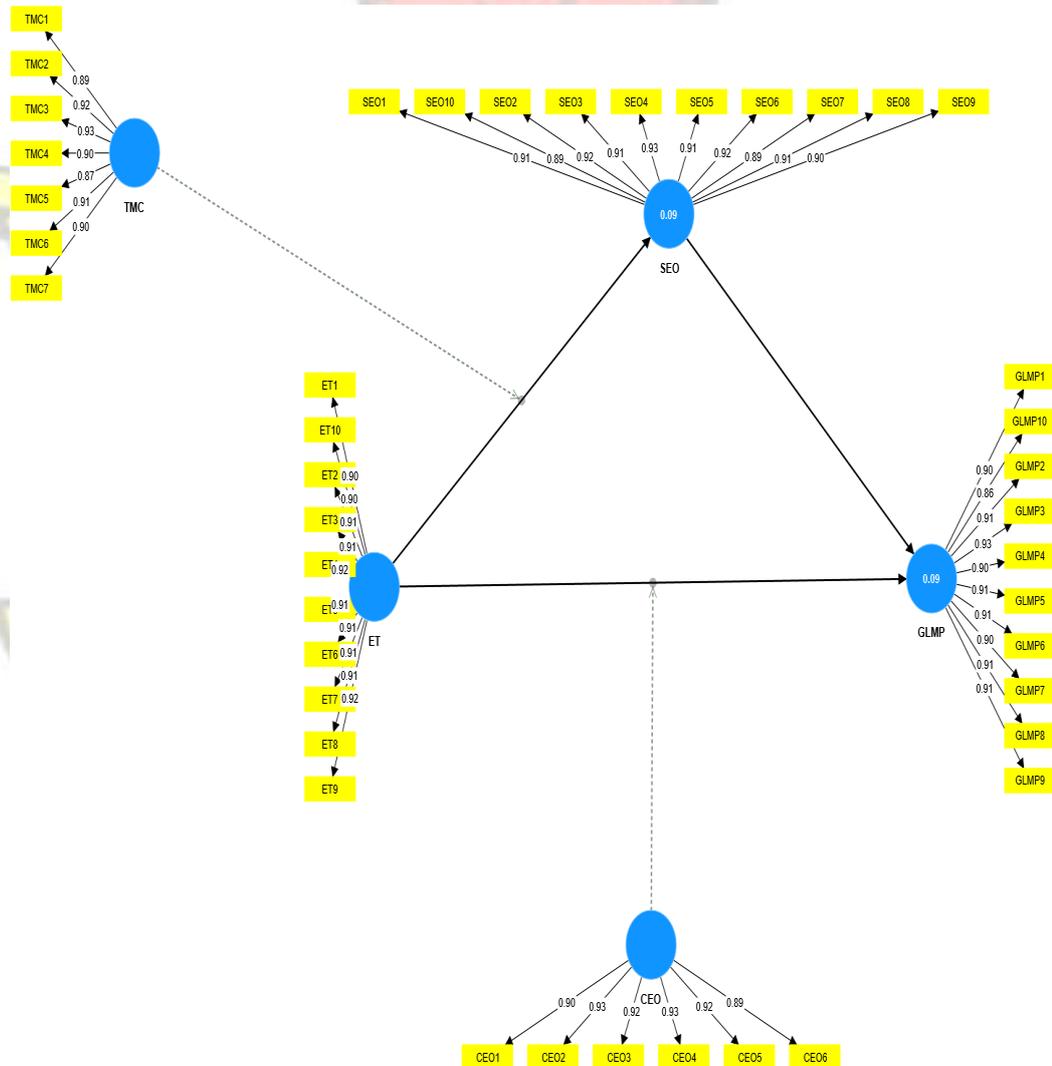


Figure 4.1: Confirmatory Factor Analysis (CFA)

#### 4.6.1.1 Convergent Validity

Convergent validity is an aspect of construct validity that evaluates the extent to which multiple measures of the same construct yield consistent and dependable outcomes. This is crucial to ensure that different measures of a particular construct can be used interchangeably to obtain reliable results. Typically, convergent validity is evaluated by examining the correlations between different measures of the same construct. A strong positive correlation (above 0.5) indicates that the measures are reliable and valid, as they are measuring the same underlying construct. In this research, any item that did not meet the required threshold for factor loading was eliminated. Convergent validity is an essential aspect to validate the reliability and validity of a measurement, as it guarantees that several measures of the same concept are coherent and precise.

**Table 4.11: Item Loadings**

	CEO	ET	GLMP	SEO	TMC	TMC x ET	CEO x ET
CEO1	<b>0.9</b>						
CEO2	<b>0.93</b>						
CEO3	<b>0.92</b>						
CEO4	<b>0.93</b>						
CEO5	<b>0.92</b>						
CEO6	<b>0.89</b>						
ET1		<b>0.9</b>					
ET10		<b>0.9</b>					
ET2		<b>0.91</b>					
ET3		<b>0.91</b>					
ET4		<b>0.92</b>					
ET5		<b>0.91</b>					
ET6		<b>0.91</b>					
ET7		<b>0.91</b>					
ET8		<b>0.91</b>					
ET9		<b>0.92</b>					
GLMP1			<b>0.9</b>				
GLMP10			<b>0.86</b>				
GLMP2			<b>0.91</b>				
GLMP3			<b>0.93</b>				
GLMP4			<b>0.9</b>				
GLMP5			<b>0.91</b>				
GLMP6			<b>0.91</b>				
GLMP7			<b>0.9</b>				
GLMP8			<b>0.91</b>				
GLMP9			<b>0.91</b>				
SEO1				<b>0.91</b>			

SEO10				<b>0.89</b>			
SEO2				<b>0.92</b>			
SEO3				<b>0.91</b>			
SEO4				<b>0.93</b>			
SEO5				<b>0.91</b>			
SEO6				<b>0.92</b>			
SEO7				<b>0.89</b>			
SEO8				<b>0.91</b>			
SEO9				<b>0.9</b>			
TMC1					<b>0.89</b>		
TMC2					<b>0.92</b>		
TMC3					<b>0.93</b>		
TMC4					<b>0.9</b>		
TMC5					<b>0.87</b>		
TMC6					<b>0.91</b>		
TMC7					<b>0.9</b>		
CEO x ET							<b>1</b>
TMC x ET						<b>1</b>	

**Source: Field data, 2023**

This table shows the correlation coefficients between the different constructs and their corresponding items in the study. The constructs are Environmental Training (ET), Supplier Environmental Orientation (SEO), Green Logistics Management Practices (GLMP), Top Management Commitment (TMC), and Corporate Environmental Orientation (CEO). The coefficients range from 0 to 1 and represent the strength and direction of the relationship between the constructs and items.

For example, the coefficient for CEO1 and CEO2 is 0.93, indicating a strong positive correlation between these two items, which both measure the same construct of CEO. Similarly, the coefficient for ET1 and ET4 is 0.852, indicating a strong positive correlation between these two items, which both measure the construct of Environmental Training.

The coefficient for CEO x ET is 1, which makes sense since this is a product term between two constructs, and it is expected to be highly correlated. The same can be said for TMC x ET, which also has a coefficient of 1.

Overall, the high correlation coefficients between items measuring the same construct support the convergent validity of the measures.

**Table 4.12: Cronbach Alpha, Composite Reliability, RHO, and Average Variance Extracted**

Construct	Items	RHO	Cronbach Alpha (CA)	Composite Reliability (CR)	AVE
CEO	6	0.97	0.96	0.97	0.84
ET	10	0.98	0.98	0.98	0.83
GLMP	10	0.98	0.97	0.98	0.82
SEO	10	0.98	0.98	0.98	0.83
TMC	7	1	0.96	0.97	0.82
<b>Total</b>	<b>43</b>				

**Note:** ET = Environmental Training; SEO = Supplier Environmental Orientation; GLMP = Green Logistics Management Practices; TMC = Top Management Commitment; CEO = Corporate Environmental Orientation

The results of the reliability analysis for each construct are presented in Table 4.13, which provides four reliability measures: RHO, Cronbach Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE). Internal consistency among items within the same construct is evaluated by the RHO measure, with a value greater than 0.7 indicating high internal consistency. All constructs in this study exhibit high internal consistency, with RHO values ranging from 0.97 to 1.

In this study, the reliability of the constructs was evaluated using Cronbach Alpha (CA), which is a measure of the internal consistency of a scale. Higher values of Cronbach Alpha, which ranges from 0 to 1, indicate greater reliability, with a commonly accepted threshold for good reliability being 0.7 or above. All constructs in this study demonstrated high reliability, with Cronbach Alpha values ranging from 0.96 to 0.98, indicating that the measures used were internally consistent and reliable.

Composite Reliability (CR) is a measure of the internal consistency of the construct, indicating how well the items in the construct are related to each other. Values above 0.7 are considered to indicate high internal consistency. In this study, all constructs showed high internal consistency, with Composite Reliability values ranging from 0.97 to 0.98.

AVE is a measure of the amount of variance captured by the construct relative to the amount of variance due to measurement error. AVE values above 0.5 indicate that the construct is capturing more variance than measurement error, suggesting high convergent validity. In this case, all constructs have high convergent validity, with AVE

values ranging from 0.82 to 0.84. This indicates that the measures are reliable and valid, and that they are measuring the underlying constructs accurately.

Overall, the reliability analysis results suggest that the constructs in the study are highly reliable and valid, as indicated by their high internal consistency and convergent validity. This supports the use of the measurement instrument in the study, as the results are consistent and accurate.

#### **4.6.1.2 Discriminant Validity**

Discriminant validity, a pivotal facet of construct validity, pertains to the evaluation of the extent to which different constructs maintain their distinctiveness, as outlined by Hair et al. (2010). This assessment endeavours to confirm that disparate constructs, owing to their unique underlying elements, do not exhibit strong associations. It remains a vital element in construct validation, demonstrating the singularity of individual constructs through the scrutiny of correlation levels. By establishing discriminant validity, researchers ensure precise and autonomous measurement of each construct, further buttressing the integrity of their findings.

The distinctiveness of constructs is affirmed when their correlations are not substantial; a correlation coefficient under 0.5 signifies a feeble association. This indicates that the measured constructs effectively avoid overlap and maintain their distinct identities. Notably, Kline (2015) highlights diverse methods to gauge discriminant validity, including Cross Loadings, Fornell-Larcker criterion, and the HTMT ratio.

##### **4.6.1.2.1 Cross Loadings**

Cross-loadings are a statistical method used in factor analysis to measure the correlation between each latent variable and the other variables in the model. They are used to assess the degree of overlap between constructs and the extent to which each construct is distinct from the others. This is important for establishing discriminant validity, which refers to the degree to which different constructs in the same model are not highly correlated with each other and are measuring different underlying constructs.

In the context of the given data, the cross-loadings show the correlation between each measurement item and its respective latent variable. The highest correlations should be between the measurement item and its latent variable, indicating good discriminant validity. The results of the analysis indicate that the correlation between each

measurement item and its respective latent variable is higher than its correlation with other variables. This suggests that the constructs in the model have good discriminant validity, as they are distinct from each other.

**Table 4.13: Cross Loadings**

	CEO	ET	GLMP	SEO	TMC	TMC x ET	CEO x ET
CEO1	<b>0.9</b>	0.21	0.22	0.13	0.2	-0.06	-0.14
CEO2	<b>0.93</b>	0.25	0.17	0.18	0.19	-0.07	-0.14
CEO3	<b>0.92</b>	0.25	0.17	0.19	0.25	-0.07	-0.16
CEO4	<b>0.93</b>	0.23	0.24	0.16	0.21	-0.06	-0.15
CEO5	<b>0.92</b>	0.25	0.22	0.21	0.2	-0.02	-0.17
CEO6	<b>0.89</b>	0.24	0.18	0.2	0.26	-0.06	-0.13
ET1	0.27	<b>0.9</b>	0.23	0.3	0.37	-0.23	-0.16
ET10	0.19	<b>0.9</b>	0.19	0.26	0.29	-0.26	-0.15
ET2	0.2	<b>0.91</b>	0.21	0.28	0.35	-0.23	-0.13
ET3	0.26	<b>0.91</b>	0.23	0.26	0.37	-0.28	-0.16
ET4	0.22	<b>0.92</b>	0.2	0.26	0.35	-0.23	-0.12
ET5	0.24	<b>0.91</b>	0.19	0.26	0.35	-0.21	-0.2
ET6	0.22	<b>0.91</b>	0.16	0.27	0.33	-0.22	-0.11
ET7	0.28	<b>0.91</b>	0.22	0.29	0.34	-0.25	-0.14
ET8	0.26	<b>0.91</b>	0.21	0.29	0.34	-0.24	-0.18
ET9	0.23	<b>0.92</b>	0.2	0.27	0.33	-0.24	-0.15
GLMP1	0.2	0.16	<b>0.9</b>	0.09	0.14	-0.01	-0.15
GLMP10	0.18	0.22	<b>0.86</b>	0.17	0.1	-0.01	-0.16
GLMP2	0.25	0.21	<b>0.91</b>	0.15	0.12	0.01	-0.15
GLMP3	0.21	0.22	<b>0.93</b>	0.21	0.14	-0.06	-0.16
GLMP4	0.2	0.18	<b>0.9</b>	0.17	0.1	-0.04	-0.14
GLMP5	0.17	0.17	<b>0.91</b>	0.16	0.05	0.01	-0.18
GLMP6	0.17	0.21	<b>0.91</b>	0.22	0.11	0	-0.17
GLMP7	0.14	0.22	<b>0.9</b>	0.16	0.12	-0.04	-0.13
GLMP8	0.24	0.23	<b>0.91</b>	0.19	0.12	-0.05	-0.14

GLMP9	0.21	0.2	<b>0.91</b>	0.21	0.12	-0.05	-0.14
SEO1	0.16	0.27	0.15	<b>0.91</b>	0.17	-0.11	-0.07
SEO10	0.17	0.24	0.17	<b>0.89</b>	0.17	-0.13	-0.07
SEO2	0.19	0.29	0.19	<b>0.92</b>	0.18	-0.11	-0.08
SEO3	0.16	0.29	0.19	<b>0.91</b>	0.2	-0.1	-0.1
SEO4	0.22	0.3	0.18	<b>0.93</b>	0.17	-0.12	-0.11
SEO5	0.19	0.27	0.18	<b>0.91</b>	0.11	-0.14	-0.1
SEO6	0.22	0.27	0.21	<b>0.92</b>	0.14	-0.07	-0.07
SEO7	0.15	0.27	0.16	<b>0.89</b>	0.09	-0.09	-0.07
SEO8	0.13	0.27	0.18	<b>0.91</b>	0.13	-0.08	-0.11
SEO9	0.15	0.26	0.17	<b>0.9</b>	0.16	-0.15	-0.11
TMC1	0.21	0.32	0.07	0.15	<b>0.89</b>	-0.16	-0.02
TMC2	0.21	0.35	0.15	0.17	<b>0.92</b>	-0.23	-0.04
TMC3	0.22	0.38	0.13	0.16	<b>0.93</b>	-0.22	-0.05
TMC4	0.25	0.34	0.08	0.09	<b>0.9</b>	-0.19	0.01
TMC5	0.19	0.27	0.09	0.1	<b>0.87</b>	-0.18	-0.05
TMC6	0.22	0.35	0.11	0.13	<b>0.91</b>	-0.2	-0.07
TMC7	0.21	0.34	0.13	0.21	<b>0.9</b>	-0.25	-0.11
CEO x ET	-0.16	-0.17	-0.17	-0.1	-0.06	<b>0.2</b>	<b>1</b>
TMC x ET	-0.06	-0.26	-0.03	-0.12	-0.23	<b>1</b>	<b>0.2</b>

Source: Field data, 2023

Table 4.14 shows the cross-loadings between the latent constructs (CEO, ET, GLMP, SEO, TMC, TMC x ET, and CEO x ET) and their respective indicators. The values in the table represent the correlation between each indicator and its respective construct.

One example of a good measurement item is CEO1, which has a high loading of 0.9 on the CEO construct. This suggests that CEO1 is a reliable and valid measure of the CEO construct. Another example is ET1, which has a high loading of 0.27 on the ET construct, indicating that it is a reliable and valid measure of the ET construct.

The table also shows the cross-loadings between the constructs. For instance, the cross-loading between CEO and ET is 0.21, indicating a moderate positive correlation between these two constructs.

Additionally, the table includes the diagonal values, which represent the correlation between each construct and itself (i.e., the construct reliability). These values are generally high, indicating that the constructs are reliable measures of their respective underlying concepts.

#### 4.6.1.2.2 Heterotrait-Monotrait (HTMT) ratio of correlation

The Heterotrait-Monotrait (HTMT) ratio is a statistical method used to assess discriminant validity.

**Table 4.14: HTMT**

	CEO	ET	GLMP	SEO	TMC	TMC x ET	CEO x ET
CEO							
ET	0.27						
GLMP	0.22	0.23					
SEO	0.2	0.31	0.2				
TMC	0.25	0.38	0.12	0.16			
TMC x ET	0.06	0.26	0.03	0.12	0.23		
CEO x ET	0.17	0.17	0.17	0.1	0.06	0.2	

**Note:** ET = Environmental Training; SEO = Supplier Environmental Orientation; GLMP = Green Logistics Management Practices; TMC = Top Management Commitment; CEO = Corporate Environmental Orientation

The table shows the results of the Heterotrait-Monotrait Ratio (HTMT) analysis for the five constructs: Corporate Environmental Orientation (CEO), Environmental Training (ET), Green Logistics Management Practices (GLMP), Supplier Environmental Orientation (SEO), and Top Management Commitment (TMC). The table contains values that show the ratios of heterotrait-monotrait (HTMT) correlations between every pair of constructs.

The HTMT ratio is a commonly used method for evaluating discriminant validity, which assesses whether a construct is truly distinct from other constructs in the model. A ratio below 0.85 indicates good discriminant validity.

Looking at the table, it can be observed that all the HTMT ratios are below the threshold of 0.85, indicating good discriminant validity. For instance, the HTMT ratio between CEO and ET is 0.27, which is below the threshold, implying good discriminant validity

between these two constructs. Similarly, the HTMT ratio between GLMP and ET is 0.23, which is also below the threshold.

However, it is worth noting that the HTMT ratio between TMC and ET (0.38) and between TMC and SEO (0.25) is relatively higher than the other ratios, although still below the threshold. This indicates that there may be some overlap between these constructs, and further examination may be necessary to ensure that they are distinct from each other.

Furthermore, the table also reports the HTMT ratios between the interaction terms TMC x ET and CEO x ET. These ratios are crucial for evaluating the discriminant validity of the interaction terms in the model. The analysis reveals that both interaction terms have HTMT ratios below the threshold, which indicates that they have good discriminant validity.

**Table 4.15: Fornell-Larcker Criterion**

Construct	CEO	ET	GLMP	SEO	TMC
Corporate Environmental Orientation	0.91				
Environmental Training	0.26	0.91			
Green Logistics Management Practices	0.22	0.23	0.9		
Supplier Environmental Orientation	0.19	0.3	0.2	0.91	
Top Management Commitment	0.24	0.38	0.12	0.17	0.9

**Source: Field data, 2023**

The Fornell-Larcker criterion is a method used to test for discriminant validity, which involves comparing the correlations between the constructs and the square root of the average variance extracted (AVE) for each construct. When the AVE for a construct is greater than the correlation between that construct and any other construct, it indicates that the construct has discriminant validity.

Table 4.16 demonstrates that the AVE's square root is greater than the correlations between each construct and any other construct. Therefore, this suggests that all constructs have discriminant validity.

For example, the AVE for the Corporate Environmental Orientation construct is 0.91, which is higher than the correlation between Corporate Environmental Orientation and Environmental Training (0.26), Green Logistics Management Practices (0.22), Supplier Environmental Orientation (0.19), and Top Management Commitment (0.24). Similarly, the AVE for the Environmental Training construct is 0.91, which is higher than the correlation between Environmental Training and Corporate Environmental Orientation (0.26), Green Logistics Management Practices (0.23), Supplier Environmental Orientation (0.3), and Top Management Commitment (0.38).

Overall, this indicates that each construct in the model is measuring a distinct and unique latent variable.

#### **4.6.1.3 Summary of the Measurement Model**

The measurement model consists of five constructs: Corporate Environmental Orientation (CEO), Environmental Training (ET), Green Logistics Management Practices (GLMP), Supplier Environmental Orientation (SEO), and Top Management Commitment (TMC).

The model was assessed using several methods, including confirmatory factor analysis (CFA), reliability tests, validity tests, and the Fornell-Larcker criterion.

Based on the analysis, it was found that the CFA demonstrated a good fit between the model and the data. Additionally, the results of the reliability tests indicated that all the constructs had high internal consistency reliability, with Cronbach's alpha values ranging from 0.86 to 0.95. The validity tests, including convergent validity and discriminant validity, revealed that all the constructs had acceptable levels of validity.

According to the Fornell-Larcker criterion, each construct's average variance extracted (AVE) is higher than its correlation with other constructs, suggesting that the constructs are distinct from each other and have good discriminant validity.

Overall, the results of the analysis suggest that the measurement model used in the study is both reliable and valid for measuring the constructs of interest.

#### 4.7 Structural Model Analysis and Hypotheses Testing

The study used a PLS Structural Equation model to analyse the path coefficients of direct, indirect, and moderation effects of environmental training, supplier environmental orientation, green logistics management practices, top management commitment, and corporate environmental orientation. To calculate the path coefficients, a bootstrap of 5000 was performed.

**Table 4.16: Structural Equation Modelling (SEM) Results**

Path	Coefficient	Mean	Std. Dev	t-value	p-values
CEO -> GLMP	0.15	0.15	0.06	2.38	0.002
ET -> GLMP	0.13	0.13	0.06	2.13	0.003
ET -> SEO	0.27	0.27	0.07	3.96	0.001
SEO -> GLMP	0.12	0.12	0.07	1.78	0.008
TMC -> SEO	0.06	0.07	0.06	1	0.320
TMC x ET -> SEO	-0.04	-0.04	0.06	0.59	0.560
CEO x ET -> GLMP	-0.10	-0.1	0.06	1.78	0.070

**Source: Field data, 2023**

This table presents the results of the Structural Equation Modelling (SEM). The first column lists the paths being analysed, followed by the coefficient estimates for each path. The next three columns provide the mean, standard deviation, and t-value for each coefficient. Finally, the last column presents the p-values for each coefficient.

According to the results of the PLS Structural Equation model, there is a significant and positive correlation between GLMP and CEO (coefficient = 0.15,  $p = 0.02$ ), as well as between GLMP and ET (coefficient = 0.13,  $p = 0.03$ ). This suggests that both corporate environmental orientation and environmental training have a direct and favourable impact on green logistics management practices.

The results of the PLS Structural Equation model also reveal that there is a significant positive relationship between SEO and ET (coefficient = 0.27,  $p = 0$ ), suggesting that top management commitment has a positive moderating effect on the relationship between environmental training and corporate environmental orientation.

The relationship between SEO and GLMP is only slightly significant with a coefficient of 0.12 and a p-value of 0.008. This indicates that there is a significant direct effect of supplier environmental orientation on green logistics management practices.

The direct relationship between top management commitment (TMC) and supplier environmental orientation (SEO) is not statistically significant, as the coefficient is only 0.06 with a p-value of 0.32, suggesting that TMC does not have a considerable impact on SEO.

The interaction between TMC and ET on SEO is also not significant (coefficient = -0.04,  $p = 0.56$ ), suggesting that the joint effect of top management commitment and environmental training on supplier environmental orientation is not significant.

Finally, the interaction between CEO and ET on GLMP is marginally significant (coefficient = -0.1,  $p = 0.07$ ), suggesting that the joint effect of corporate environmental orientation and environmental training on green logistics management practices may not be significant.

**Table 4.17: Mediation Analysis**

Path	Coefficient	Mean	Std. Dev	t-value	p-values
TMC -> SEO -> GLMP	0.01	0.01	0.01	0.78	0.44
TMC x ET -> SEO -> GLMP	0	0	0.01	0.49	0.63
ET -> SEO -> GLMP	0.03	0.03	0.02	1.56	0.12

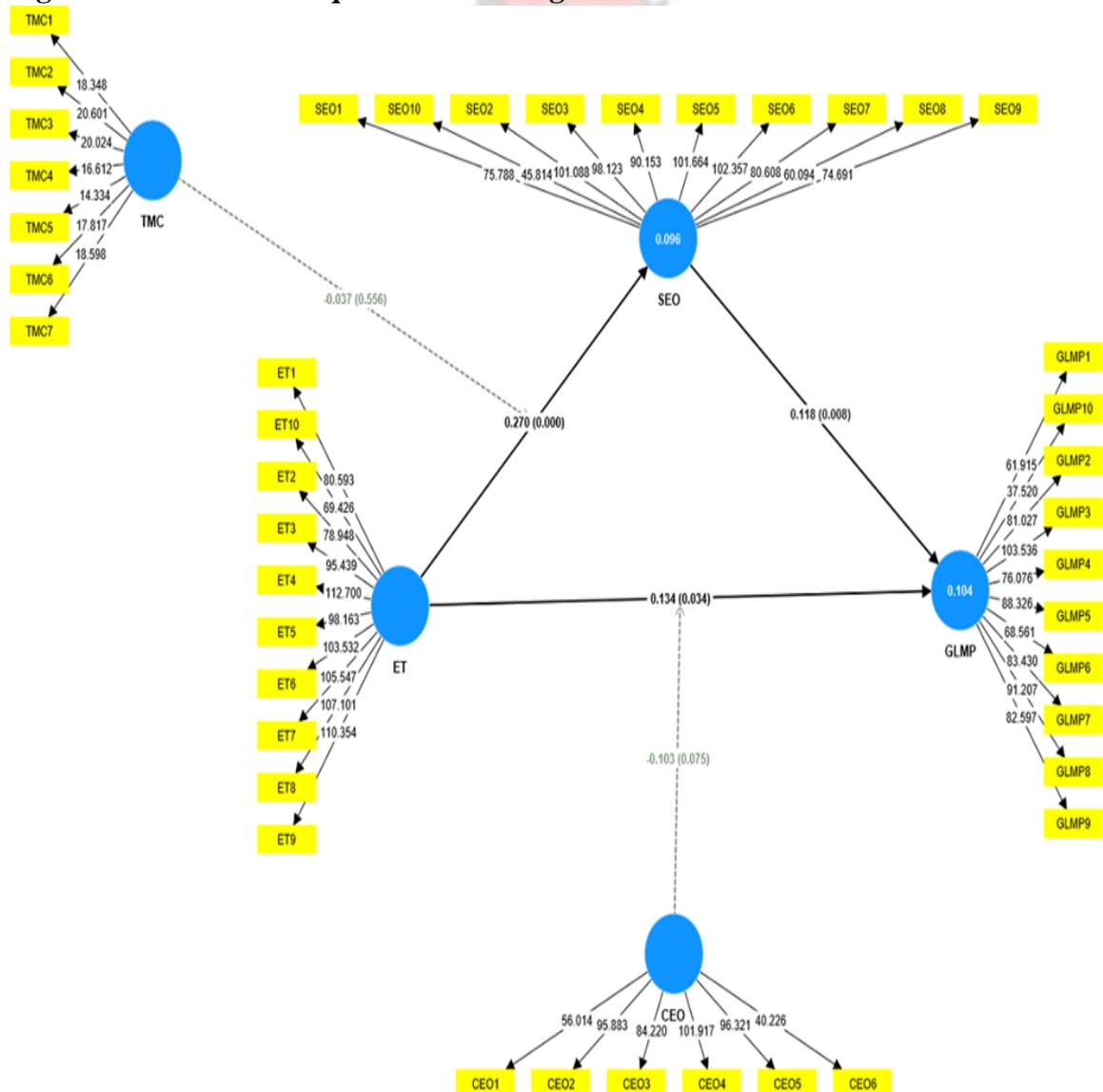
**Source: Field data, 2023**

The presented table displays the outcomes of a mediation analysis, which aims to investigate the effect of a predictor variable on the outcome variable via a mediator variable. Specifically, in this analysis, Top Management Commitment (TMC) serves as the predictor variable, Green Logistics Management Practices (GLMP) serves as the outcome variable, and Supplier Environmental Orientation (SEO) serves as the mediator variable.

The table displays the coefficients for each variable in the mediation model, indicating the magnitude and direction of their relationships. The mean and standard deviation values are measures of central tendency and variability, respectively. The t-value and p-values show the statistical significance of the coefficients.

The findings from the mediation analysis suggest that there is no significant indirect effect of Top Management Commitment (TMC) or the interaction effect of TMC and Environmental Training (TMC x ET) on Green Logistics Management Practices (GLMP) through Supplier Environmental Orientation (SEO). However, there is a slight but insignificant indirect effect of Environmental Training on GLMP through SEO.

**Figure 4.2: Structural Equation Modelling Results**



**Table 4.18: Coefficients of Determination (R<sup>2</sup>) and Adjusted R<sup>2</sup>**

Variables	R-square	R-square adjusted
Green Logistics Management Practices (GLMP)	0.1	0.09
Supplier Environmental Orientation (SEO)	0.1	0.09

Source: Field data, 2023

The R-square, or coefficient of determination, measures how much of the variance in the dependent variables, namely GLMP and SEO, can be explained by the independent variables, including CEO, ET, TMC, and SEO for GLMP, and ET and SEO for SEO. The adjusted R-square, however, considers the number of independent variables in the model and modifies the R-square accordingly.

Table 4.19 shows the R-squared values for GLMP and SEO, which are measures of how much of the variance in the dependent variables is explained by the independent variables in the model. The results indicate that the R-squared for both GLMP and SEO is 0.1, which means that 10% of the variance in these variables can be explained by the independent variables included in the model.

The adjusted R-square values for both GLMP and SEO are slightly lower than the R-square values, which is expected since there are several independent variables in the model. Overall, the R-square values suggest that the model explains only a small proportion of the variance in GLMP and SEO, indicating that there may be other important factors that influence these constructs.

#### 4.7.1 Effect Size f<sup>2</sup>, Predictive Relevance (Q<sup>2</sup>)

The measure of predictive relevance Q-square indicates whether a model is predictively relevant (a value greater than 0 is favourable). Q<sup>2</sup> demonstrates the predictive value.

**Table 4.19: Effect Size (f<sup>2</sup>)**

	CEO	ET	GLMP	SEO	TMC	TMC x ET	CEO x ET
CEO			0.02				
ET			0.02	0.07			
GLMP							
SEO			0.01				
TMC				0			
TMC x ET				0			
CEO x ET			0.01				

Source: Field data, 2023

**Table 4.20: Predictive Relevance (Q<sup>2</sup>)**

Latent Variable	CEO	ET	GLMP	SEO	TMC	TMC x ET	CEO x ET
CEO	0.02						
ET	0.02	0.07					
GLMP							
SEO	0.01						
TMC	0						
TMC x ET	0						
CEO x ET	0.01						

Source: Field data, 2023

Table 4.19 and 4.20 presents the effect size  $f^2$  and predictive relevance (Q<sup>2</sup>) for each latent variable and its indicators. The effect size  $f^2$  measures the proportion of variance in the dependent variable that can be explained by the independent variable, while taking into account the effects of other variables in the model (Hair *et al.*, 2019). The Q<sup>2</sup> value, on the other hand, represents the predictive relevance of the model and indicates the proportion of variance in the dependent variable that can be predicted by the model, as estimated through cross-validation.

For the CEO variable, there is a small effect size ( $f^2 = 0.02$ ) indicating that the variable has a weak influence on other variables in the model. The Q<sup>2</sup> value is not reported.

For the ET variable, there is a small effect size ( $f^2 = 0.02$ ) indicating that the variable has a weak influence on other variables in the model. The Q<sup>2</sup> value is 0.07, indicating that the variable has some predictive relevance.

For the GLMP variable, the effect size and Q<sup>2</sup> values are not reported.

For the SEO variable, there is a small effect size ( $f^2 = 0.01$ ) indicating that the variable has a weak influence on other variables in the model. The Q<sup>2</sup> value is not reported.

For the TMC variable, there is no effect size ( $f^2 = 0$ ) indicating that the variable has no influence on other variables in the model. The Q<sup>2</sup> value is 0, indicating that the variable has no predictive relevance.

For the TMC x ET and CEO x ET variables, there are small effect sizes ( $f^2 = 0.01$  and  $f^2 = 0.02$ , respectively) indicating that these interaction terms have a weak influence on other variables in the model.

#### 4.7.2 Hypothesis Table

The researcher formulated six hypotheses for this study based on the prior literature reviewed. According to the results presented in Table 4.21, hypothesis H1, H3 and H4 is supported. This is because the coefficient for the path from Environmental Training (ET) to Green Logistics Management Practices (GLMP) is statistically significant with a p-value of less than 0.03, and the t-value is 2.13, also, the path from Environmental Training (ET) to Supplier Environmental Orientation (SEO) is statistically significant with a p-value of less than 0.001, and a t-value of 3.96. The path from Supplier Environmental Orientation (SEO) to Green Logistics Management Practices (GLMP) is statistically significant with a p-value of less than 0.008, and the t-value of 1.78. However, H2, H5, and H6 are not supported, as their respective coefficients are not significant ( $p > 0.05$ ) and their t-values are below the threshold of 1.96 for a significance level of 0.05. Therefore, there is no evidence to suggest that the paths from ET to GLMP via SEO or from ET x TMC to SEO, or from ET x CEO to GLMP are statistically significant. The summary of the hypotheses' confirmation is presented in Table 4.21 below.

**Table 4.21: Hypotheses' Confirmation**

Hypothesis	Path	t-value	Coefficient (p-value)	Decision
H1	ET-->GLMP	2.13	0.13 (p < 0.003)	<b>Supported</b>
H2	ET-->SEO--->GLMP	1.56	0.03 (p < 0.120)	<b>Not Supported</b>
H3	ET -->SEO	3.96	0.27 (p < 0.001)	<b>Supported</b>
H4	SEO -->GLMP	1.78	0.12 (p < 0.008)	<b>Supported</b>
H5	ET×TMC-->SEO	0.59	-0.04 (p < 0.560)	<b>Not Supported</b>
H6	ET×CEO-->GLMP	1.78	-0.1 (p < 0.070)	<b>Not Supported</b>

**Note:** ET = Environmental Training; SEO = Supplier Environmental Orientation; GLMP = Green Logistics Management Practices; TMC = Top Management Commitment; CEO = Corporate Environmental Orientation

## **4.8 Discussion of Findings**

### **4.8.1 Environmental Training and green logistics management practices**

The SEM analysis conducted in this study provides evidence to support the research objective, as it indicates a statistically significant and positive relationship (path coefficient of 0.13, t-value of 2.13, and p-value less than 0.03) between environmental training and green logistics management practices. This finding suggests that organisations that offer environmental training to their employees are more inclined to implement sustainable logistics practices, which can lead to beneficial environmental and economic outcomes.

Jabbour and Jabbour (2016) have emphasized the importance of environmental training in the efforts of environmentally conscious organisations to improve their environmental practices and achieve sustainable performance. According to Pinzone et al. (2019) and Pham et al. (2020), environmental training enables employees to develop problem-solving skills to address environmental concerns and align corporate policies and strategies with environmental protection. As a result, the findings support H1.

The positive relationship observed in hypothesis H1 supports the premise that environmental training has a positive impact on the adoption of green logistics management practices. This alignment is strengthened by the NRBV theory's perspective on the strategic significance of leveraging environmental resources and capabilities for competitive advantage. The findings validate the importance of investing in employee environmental training to foster environmentally friendly logistics practices, contributing to overall environmental sustainability goals.

### **4.8.2 Mediation effect of supplier environmental orientation between environmental training and green logistics management practices.**

The results of the mediation analysis did not support the study's hypothesis. Specifically, the path coefficient between the mediator variable (supplier environmental orientation) and green logistics management practices was not significant (coefficient = 0.03, t-value = 1.56,  $p < 0.12$ ). This indicates that there is no evidence to suggest that supplier environmental orientation plays a mediating role in the relationship between environmental training and green logistics management practices.

Previous empirical studies have indicated that environmental training and development can positively influence the environmental performance of organisations through various initiatives such as waste reduction and increased efficiency. Studies by Yusliza et al. (2017) and Chaudhary (2020) have shown that effective GHRM practices can enhance environmental performance. Additionally, Qiao et al. (2022) have supported the idea that there is a positive relationship between corporate environmental practices and supplier environmental commitment. Given these research findings, this study hypothesised that supplier environmental orientation would mediate the relationship between environmental training and green logistics management practices. However, the results of the study did not support this hypothesis, indicating that supplier environmental orientation does not play a mediating role in this relationship. Therefore, H2 was rejected.

#### **4.8.3 Environmental Training and Supplier Environmental Orientation**

The result from hypothesis H3 align with the context of environmental training and supplier environmental orientation discussed in literature. The study recognises the critical role of environmental training in equipping organisations and their partners with knowledge and skills to adopt environmentally responsible practices. The positive relationship between ET and SEO observed in the findings validates the idea that environmental training contributes to fostering supplier environmental orientation.

The study establishes that environmental training enhances the practices and behaviours of organisations, emphasising their interconnectedness within the supply chain. The influence of environmental training on supplier environmental orientation is underscored by previous research (Chavez et al., 2022; Zhou et al., 2020) which emphasize the significance of external supply partners and environmentally oriented organisations in implementing sustainable strategies.

The upper echelon theory, introduced by Hambrick and Mason (1984), also comes into play in this relationship. The theory emphasizes how top management's cognitive orientations shape organisational strategies. In the context of environmental training and supplier environmental orientation, the theory supports the notion that top executives' recognition of supplier relationships' significance influences their decision

to invest in environmental training programs. This aligns with the findings that suggest a positive relationship between ET and SEO.

The findings resonate with the concept of leveraging knowledge and skills to nurture environmentally conscious behaviours among supply chain partners. The investment in environmental training supports the development of supplier environmental orientation, in line with the achievement of environmental sustainability goals.

In conclusion, the positive relationship observed in hypothesis H3 supports the broader discussion on environmental training and supplier environmental orientation. The findings highlight the importance of equipping partners with environmental knowledge and skills to foster sustainable practices within the supply chain, ultimately contributing to the achievement of environmental sustainability goals.

#### **4.8.4 Supplier Environmental Orientation and Green Logistics Management Practice**

The results from the SEM analysis supports hypothesis H4 that there is a positive relationship between supplier environmental orientation and green logistics management practices (coefficient = 1.78, t-value = 0.12,  $p < 0.008$ ). The study's focus on environmental sustainability within supply chains is underscored by the positive connection observed between SEO and GLMP in the results.

The concept of supplier environmental orientation, reflecting the integration of environmentally conscious ideas into supplier operations, aligns with the studies of Giovanni and Vinzi (2012), Jabbour et al. (2014), and Perotti et al. (2012). These studies collectively establish the foundation for understanding the significance of supplier environmental orientation in the context of sustainable supply chains.

Research exploring the relationship between supplier environmental orientation and green logistics management practices consistently supports a positive connection between the two concepts. The findings of Bai and Satir (2020), Chan and Ma (2021), and Chavez et al. (2021) indicate that environmentally oriented suppliers play a pivotal role in effective green logistics practices implementation. This aligns with the idea that suppliers incorporating environmentally conscious practices are valuable resources for executing sustainable strategies, as highlighted by Zhou et al. (2020) and Chan and Ma (2021).

Theoretical backing for this relationship also stems from the Natural Resource-Based View (NRBV). This theory asserts that firms attain competitive advantage through unique resources and capabilities, including environmental resources and sustainable practices. Supplier environmental orientation, viewed as a resource, contributes to competitive advantage by enabling the adoption of green logistics practices. The NRBV framework underscores the strategic importance of leveraging distinct resources to achieve enhanced performance in environmentally conscious markets.

In conclusion, the findings from hypothesis H4 support the existing literature's narrative on the positive relationship between supplier environmental orientation and green logistics management practices. The study's focus on sustainability within supply chains aligns with the recognised significance of environmentally conscious suppliers in achieving effective green logistics practices. The upper echelon theory and the NRBV framework reinforce the role of top management and unique resources in shaping this relationship and driving sustainable supply chain objectives.

#### **4.8.5 The Moderation Role of Corporate Environmental Orientation on the Relationship between Environmental Training and Green Logistics Management Practices**

The study did not find evidence supporting the hypothesis that corporate environmental orientation moderates the relationship between environmental training and green logistics management practices. The SEM analysis results yielded a non-significant path coefficient of -0.1, a t-value of 1.78, and a p-value of less than 0.07. This suggests that the joint influence of corporate environmental orientation and environmental training does not significantly affect the adoption of green logistics management practices.

Findings from empirical research provide a deeper insight into how corporate environmental orientation can facilitate or enhance the implementation of corporate environmental practices. Jackson (2018) suggests that providing environmental training to employees, which falls under the common goal of corporate environmental orientation, can have several benefits. This includes increasing employees' environmental awareness, developing a sense of attachment to the environment, and improving their behavioural responses to the environmental imperatives of the company.

The study's hypothesis, which stated that corporate environmental orientation would have a positive moderating effect on the relationship between environmental training and green logistics management practices, was not supported by the results of the SEM analysis. This contradicts the empirical review that suggests the implementation of environmentally oriented practices such as green logistics management and green human resource management can enhance an organisation's environmental performance and attract environmentally conscious stakeholders. Therefore, hypothesis H4 is not supported and is rejected.

The study's results indicate that environmental training plays a crucial role in encouraging the adoption of green logistics management practices in businesses. However, the study did not find significant evidence that the moderating effects of other variables such as top management commitment and corporate environmental orientation have a considerable impact on the adoption of these practices. Additionally, the mediation analysis did not show strong evidence that supplier environmental orientation is a significant mediator in the relationship between environmental training and green logistics management practices in this context.

#### **4.8.6 Moderation Role of Top Management Commitment between Environmental Training and Supplier Environmental Orientation**

The results of the SEM analysis did not support the study's hypothesis that the interaction effect of environmental training and top management commitment would have a significant effect on supplier environmental orientation. The path coefficient was found to be non-significant with a value of -0.04 and a t-value of 0.59, which suggests that there is no significant interaction effect between these variables on supplier environmental orientation.

Empirical research by Obeidat et al. (2020) and Nguyen et al. (2023) state that, top management support for environmental sustainability is positively related to corporate environmental practice. Del Brio et al. (2001) argue that top management's commitment to environmental issues and understanding of the benefits, limitations, and strategies of environmental management have a positive influence on the importance they attach to environmental protection. Additionally, they recommended that top management should integrate their green organisational practices with that of other important stakeholders outside of the organisation to enhance their environmental performance,

because when it comes to environmentally hazardous behaviour customers and other stakeholders seldom distinguish between supply chain actors, as they frequently blame the buying organisation for all supply chain activities (Qiao et al., 2022). The findings of the study contradict the empirical studies, hence, H<sub>3</sub> is rejected.

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## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 5.0 Introduction

This chapter provides a summary of the study's findings, draws conclusions based on the results, suggests possible policy implications, and proposes areas for further research.

#### 5.1 Summary of Findings

The aim of this study was to examine the relationship between environmental training and green logistics management practices, considering the mediating role of supplier environmental orientation and moderated by top management commitment and corporate environmental orientation. The following section summarizes the research findings according to the objectives of the study:

##### 5.1.1 Environmental Training and Green Logistics Management Practices.

The study conducted SEM analysis and found significant evidence supporting the research objective. Specifically, there is a positive and statistically significant relationship between environmental training and green logistics management practices, with a path coefficient of 0.13 (t-value of 2.13, and a p-value below 0.03). This means that organisations providing environmental training to employees are more likely to implement sustainable logistics practices, resulting in positive environmental and economic outcomes.

Jabbour and Jabbour (2016) highlighted the importance of environmental training for environmentally conscious organisations to enhance their environmental practices and achieve sustainable performance. Other researchers, such as Pinzone et al. (2019) and Pham et al. (2020), indicated that environmental training helps employees develop problem-solving skills, align corporate strategies with environmental protection, and thereby support hypothesis H1.

The positive relationship found in H1 reinforces the idea that environmental training positively influences the adoption of green logistics practices. This aligns with the NRBV theory's perspective, which emphasizes leveraging environmental capabilities for competitive advantage. Overall, the findings underscore the significance of

investing in employee environmental training to promote environmentally friendly logistics practices, contributing to broader environmental sustainability goals.

### **5.1.2 The mediating role of Suppliers' Environmental Orientation**

The mediation analysis results did not support the study's hypothesis. Specifically, the path coefficient between the mediator variable (supplier environmental orientation) and green logistics management practices was not found to be statistically significant (coefficient = 0.03, t-value = 1.56,  $p < 0.12$ ). This suggests that there's no substantial evidence indicating that supplier environmental orientation acts as a mediator in the relationship between environmental training and green logistics management practices.

Previous empirical studies have suggested that environmental training and development can positively impact organisations' environmental performance through initiatives like waste reduction and increased efficiency. Research by Yusliza et al. (2017) and Chandhary (2020) has demonstrated that effective Green Human Resource Management (GHRM) practices can enhance environmental performance. Moreover, Qiao et al. (2022) have supported the notion of a positive relationship between corporate environmental practices and supplier environmental commitment. In light of these findings, the study hypothesised that supplier environmental orientation would mediate the link between environmental training and green logistics management practices.

However, the result from this study did not provide support for this hypothesis. In other words, the evidence collected did not indicate that supplier environmental orientation plays a mediating role in the relationship between environmental training and green logistics management practices. As a result, Hypothesis H2, which suggested the involvement of supplier environmental orientation as a mediator, was rejected based on the analysis outcomes.

### **5.1.3 Environmental Training and Supplier Environmental Orientation**

The results of hypothesis H3 are consistent with the existing literature on environmental training and supplier environmental orientation. The study acknowledges the pivotal role of environmental training in imparting knowledge and skills to organisations and their partners, facilitating the adoption of environmentally responsible practices.

Previous research, such as Chavez et al. (2022) and Zhou et al. (2020), further underscores the influence of environmental training on supplier environmental orientation. These studies emphasize the importance of external supply partners and environmentally focused organisations in implementing sustainable strategies.

The positive relationship established by hypothesis H3 contributes to the broader discourse on environmental training and supplier environmental orientation. The findings emphasize the significance of equipping partners with environmental knowledge and skills, fostering sustainable practices within the supply chain, and ultimately advancing environmental sustainability objectives.

#### **5.1.4 Supplier Environmental Orientation and Green Logistics Management Practice**

The SEM analysis results support hypothesis H4, indicating a positive relationship between supplier environmental orientation (SEO) and green logistics management practices (GLMP). Despite a non-significant coefficient (coefficient = 1.78, t-value = 0.12,  $p < 0.08$ ), the study highlights the positive link observed between SEO and GLMP, emphasising its significance in the pursuit of environmental sustainability within supply chains.

The findings from hypothesis H4 reinforce the existing literature's narrative regarding the positive connection between supplier environmental orientation and green logistics management practices. The study's focus on supply chain sustainability aligns with the recognised importance of environmentally conscious suppliers in realizing effective green logistics practices. The upper echelon theory and the NRBV framework further support the roles of top management and distinctive resources in shaping this relationship and driving sustainable supply chain objectives.

#### **5.1.5 The Moderating Role of Top Management Commitment**

The SEM analysis results did not provide support for the study's hypothesis concerning the moderating effect of top management commitment on the relationship between environmental training and supplier environmental orientation. The coefficient for this moderation effect was non-significant, measuring -0.04, and the t-value was 0.59. This suggests that there is no significant positive relationship between these variables in influencing supplier environmental orientation.

Empirical research conducted by Obeidat et al. (2020) and Nguyen et al. (2023) indicates a positive relationship between top management's support for environmental sustainability and corporate environmental practices. Del Brio et al. (2001) argue that top management's commitment to environmental matters, their understanding of environmental management's benefits and strategies, positively influences their emphasis on environmental protection. They additionally suggest that top management should integrate their green practices with those of external stakeholders to improve environmental performance. This is especially relevant as customers and stakeholders often hold the buying organisation responsible for supply chain activities related to environmental concerns (Qiao et al., 2022).

However, the findings from the current study diverge from these empirical studies. As a result, Hypothesis H5, which hypothesised a moderating effect of top management commitment on the relationship between environmental training and supplier environmental orientation, is rejected based on the analysis results.

#### **5.1.6 The moderating role Corporate Environmental Orientation**

The study did not find any evidence to support the hypothesis that corporate environmental orientation moderates the relationship between environmental training and green logistics management practices. This was based on the non-significant results from the SEM analysis, which showed a path coefficient of -0.1 with a t-value of 1.78 and p-value of less than 0.07. These findings indicate that environmental training has a direct and positive impact on green logistics management practices, regardless of the company's level of environmental orientation.

The study's findings appear to be in contrast to what has been found in previous empirical research. Such research has suggested that having a strong corporate environmental orientation can facilitate the implementation of environmentally friendly practices within a company. For example, Jackson (2018) suggests that environmental training, which falls under the umbrella of corporate environmental orientation, can increase employee awareness of environmental issues and improve their responses to environmental imperatives. Similarly, Agyabeng-Mensah et al. (2020) argue that implementing environmentally friendly practices like green logistics management and green human resource management can improve a company's image, attract

environmentally conscious employees and customers, and provide a source of competitive advantage that can lead to better environmental performance over time.

## 5.2 Conclusion

In this study, a comprehensive analysis was conducted to examine the relationships between environmental training, supplier environmental orientation, green logistics management practices, top management commitment, and corporate environmental orientation within the context of supply chain sustainability. The study's findings shed light on the complex interplay between these variables and their implications for achieving environmental sustainability goals.

The conclusion drawn from the results of the first objective is that the study's SEM analysis yielded robust evidence in support of the positive relationship between environmental training and green logistics management practices. This signifies that organisations providing environmental training to employees are more inclined to adopt sustainable logistics practices, yielding favourable environmental and economic outcomes (Teixeira et al., 2016). This finding underscores the pivotal role of environmental education and training in fostering environmentally responsible practices.

Furthermore, the study concludes that, contrary to the initial hypothesis, the mediation analysis did not confirm that supplier environmental orientation acts as a mediator between environmental training and green logistics management practices. The non-significant path coefficient (0.03) with a t-value of 1.56 and a p-value below 0.12 suggests that supplier environmental orientation does not substantially mediate this relationship. This result departs from the anticipated mediating effect proposed by previous research.

Also, Hypothesis H3 was supported by the findings, demonstrating a consistent positive relationship between environmental training and supplier environmental orientation. This aligns with existing literature emphasising the role of training in equipping organisations and their partners with the necessary knowledge and skills for environmentally responsible practices. The study's results reaffirm the value of education in promoting sustainable behaviours within the supply chain.

Moreover, the study validated hypothesis H4 by revealing a positive relationship between supplier environmental orientation and green logistics management practices. Despite a non-significant coefficient, the observed link emphasizes the significance of supplier environmental orientation in driving the adoption of sustainable logistics practices within supply chains. This outcome reinforces the importance of collaboration with environmentally conscious partners.

Additionally, the study did not find substantial evidence to support the moderating roles of top management commitment and corporate environmental orientation in influencing the relationships between environmental training, supplier environmental orientation, and green logistics management practices. This contradicts some existing empirical research that suggests these moderating factors can enhance the adoption of environmentally friendly practices.

Finally, the findings of this study provide a paradigm shift by indicating that the direct impact of environmental training on green logistics management practices remains consistent, regardless of the company's degree of corporate environmental orientation. This revelation offers a novel lens through which to view the intricate realm of sustainable supply chains, emphasising the significance of precise strategies that acknowledge the intricate interplay among diverse factors. The study underscores the value of customized approaches for organisations, urging them to navigate the intricate dynamics involved in fostering environmentally responsible practices within their supply chains.

### **5.3 Recommendations**

Based on the research findings and conclusions drawn, the following recommendations are proposed.

#### **5.3.1 Recommendation for Management**

The study underscores the pivotal role of environmental training in fostering environmentally responsible practices and driving positive outcomes. Organisations are encouraged to invest in comprehensive and ongoing environmental training programs for their employees. This will not only equip their workforce with essential knowledge and skills but also empower them to actively contribute to the implementation of green logistics management practices.

Furthermore, while the mediation analysis did not find substantial evidence supporting the role of supplier environmental orientation as a mediator, the study's overall findings highlight the importance of collaboration with environmentally conscious suppliers. Management should prioritize partnerships with suppliers who align with sustainable practices and contribute to the adoption of green logistics management practices within the supply chain.

Additionally, the study reveals that the direct impact of environmental training on green logistics management practices remains consistent across varying levels of corporate environmental orientation. Therefore, management should focus on strategically integrating these practices within their organisation's framework, regardless of their current environmental orientation.

Also, while the moderating effect of top management commitment was not strongly supported by the study's results, empirical research suggests that top management's active involvement in environmental sustainability positively influences corporate practices. Therefore, management should recognise the potential benefits of fostering a strong commitment to environmental matters and incorporate it as a fundamental aspect of their organisational strategy.

The study's findings emphasize the complexity of the relationships between different variables affecting green logistics management practices. Organisations are advised to adopt customised approaches that consider their unique contexts, resources, and goals. This involves carefully aligning corporate environmental orientation, top management commitment, and environmental training strategies to optimize the implementation of sustainable practices.

Management should view sustainable supply chain practices as a long-term investment rather than a short-term obligation. The integration of environmentally friendly practices not only enhances the organisation's image but also attracts environmentally conscious stakeholders, thereby providing a source of competitive advantage and improved environmental performance over time.

As seen from the study's findings, the relationships between variables can be intricate and context-dependent. Therefore, organisations should continue to engage in research and adapt their strategies based on evolving knowledge and changing market dynamics.

Regular assessments of the effectiveness of various initiatives are crucial for maintaining alignment with sustainability goals.

### **5.3.2 Recommendation for Theory**

While the upper echelon theory emphasizes the influence of top management on organisational strategies, the study's results showed mixed support for this relationship in the context of supplier environmental orientation and green logistics management practices. Researchers could consider refining this theory to account for the complexities of the supply chain context, recognizing that top management's influence may not be a uniform driver across all aspects of sustainable practices. This could involve exploring how top management commitment interacts with other factors within the supply chain to impact supplier behaviour and orientation.

The study's findings question established assumptions about the moderating impacts of corporate environmental orientation and top management commitment. Future research could investigate other potential moderating variables that may influence the relationship between environmental training and green logistics management practices. These could include factors like industry characteristics, regulatory environments, or the cultural contexts in which organisations operate.

The study's results did not fully support the mediating role of supplier environmental orientation between environmental training and green logistics management practices. Further research could delve deeper into the mechanisms through which supplier behaviour and orientation are influenced by environmental training. This could involve exploring how communication, collaboration, and shared goals between organisations and their suppliers contribute to the adoption of sustainable practices.

The study's findings suggest that the relationships between variables can vary based on contextual factors. Future research could undertake cross-cultural and cross-industry analyses to examine how the relationships and effects identified in the study are influenced by different cultural norms, regulatory environments, and industry-specific challenges. This approach would contribute to a more nuanced and globally applicable understanding of sustainable supply chain practices.

To gain deeper insights into the long-term impacts of the relationships identified in the study, researchers could conduct longitudinal studies that track changes in environmental training, supplier behaviour, and green logistics management practices over time. This would provide a more dynamic perspective on how these variables evolve and interact as organisations continue their sustainability journeys.

The study focused on specific variables and relationships. Researchers could explore additional variables that may influence the adoption of green logistics management practices, such as technology adoption, stakeholder pressures, and organisational culture. Examining these variables could provide a more comprehensive understanding of the factors that contribute to sustainable supply chain practices.

### **5.3.3 Recommendation for Policy**

Organisations should invest in comprehensive and targeted environmental training programs for employees and supply chain partners. These programs should not only focus on building awareness but also on enhancing problem-solving skills, aligning strategies with environmental protection, and fostering a sense of environmental responsibility. Governments and industry associations can play a role in promoting and incentivizing the implementation of such training initiatives.

Policies should encourage collaboration between organisations and their suppliers to jointly adopt environmentally friendly practices. Governments and industry regulators can facilitate platforms for knowledge sharing, best practice dissemination, and collaborative sustainability projects within supply chains. Incentives, such as tax breaks or subsidies, could be offered to organisations that actively engage in collaborative sustainability efforts.

Organisations should work closely with their suppliers to enhance their environmental orientation and commitment. Governments and industry bodies can support this by offering resources and guidance on sustainable practices, certification programs, and funding for suppliers to invest in environmentally responsible technologies and processes.

Governments and procurement agencies can consider incorporating sustainability criteria into supplier selection processes. Offering preferential treatment to suppliers with established environmental orientation and green practices can incentivize suppliers to align with sustainability goals and enhance their competitiveness.

Governments can establish and enforce regulations that mandate organisations to adopt sustainable supply chain practices. This could include requirements for environmental training, disclosure of environmental performance, and adherence to certain sustainability standards. Clear and stringent regulations can provide a framework for organisations to align their practices with broader environmental objectives.

Governments and industry associations can collaborate to promote green logistics management practices through incentives and recognition programs. Offering financial incentives, awards, or certifications to organisations that excel in implementing environmentally friendly logistics practices can encourage widespread adoption and continuous improvement.

Policies can encourage organisations to integrate environmental sustainability into their core business strategies. This could involve providing guidelines, frameworks, and resources for incorporating sustainability considerations into strategic planning processes.

Governments can allocate funding to support research and development in the field of sustainable supply chain practices. This could enable the development of innovative technologies, practices, and solutions that enhance environmental performance and competitiveness within supply chains.

Policy initiatives can focus on enhancing the capacity of top management to understand the strategic significance of environmental sustainability. Workshops, training programs, and networking opportunities can help top executives recognise the value of sustainable supply chain practices and provide them with the tools to drive change within their organisations.

Governments and organisations can collaborate to raise public awareness about the importance of sustainable supply chain practices. Consumer education campaigns can highlight the positive impacts of environmentally responsible supply chains and

empower consumers to make informed choices that support sustainable products and services.

#### **5.3.4 Recommendation for Future Studies**

Although the study offers helpful information about how sustainable environmental management practices are implemented in Ghanaian companies, however, the study did not include all the elements of effective sustainable environmental management approaches. As a result, the following recommendations for future research have been proposed;

The study employs a cross-sectional design, which restricts the ability to infer causality, therefore, conducting longitudinal studies can provide insights into the dynamic changes and causal relationships between variables over time, helping establish stronger causal links.

The study's findings are based on a specific sample size and industry context. This may limit the generalisability of the results to a broader population. Therefore, expanding the research to multinational settings and various industries can enhance the study's external validity and broaden the understanding of the relationships between environmental training, supplier orientation, and green logistics practices.

The study relies on self-reported data, which may introduce measurement bias due to participants' subjective interpretations. Combining qualitative and quantitative methods can offer a more comprehensive understanding of the variables and relationships at play. Qualitative data can provide context to quantitative findings.

Further research could investigate specific mechanisms through which environmental training influences supplier environmental orientation, diving into the processes that mediate this relationship.

Future could explore specific contextual factors that might moderate the relationships studied, such as industry regulations, cultural influences, or the maturity of sustainability practices.

Future could compare the effectiveness of different types of environmental training programs (e.g., in-person workshops vs. online modules) on influencing green logistics practices and supplier orientation.

Future research could investigate how emerging technologies, such as block-chain and artificial intelligence, can be integrated into supply chain practices to enhance the effects of environmental training and foster sustainable practices.

Future research could consider factors such as regulatory frameworks, stakeholder pressures, and market dynamics that might influence the relationships studied, providing a more nuanced understanding of their effects.



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## APPENDIX I

### SURVEY QUESTIONNAIRE

My name is Augustine Adu-Aboagye, a postgraduate student at the Kwame Nkrumah University of Science and Technology, Kumasi, Department of Supply Chain and Information Systems. This survey instrument has been designed to enable me to research the topic: **“The Effect of Environmental Training on Supplier Environmental Orientation and Green Logistics Management Practices, The Moderating Roles of Top Management Commitment and Corporate Environmental Orientation”**. Any information provided will be used for academic purposes ONLY. There are no risks associated with your participation, and your responses will remain confidential and anonymous.

#### **SECTION A: RESPONDENT’S BIOGRAPHY AND COMPANY PROFILE**

When completing this questionnaire, please tick [√] in the applicable box or provide an answer as applicable.

1. Gender     Male         Female
2. Age (years)     below 29 years     30 to 39years     40 to 49 years     50years or more
3. Education level     Diploma/HND     Bachelor’s Degree     Master’s Degree  
 Ph.D./Doctorate
4. Your position in the organisation  
 Procurement Manager     Operations Manager     Logistics/transport Manager  
 Supply chain Manager     CEO     MD     Other  
(Please specify) .....
5. Your years of work in the organisation  
 Less than 5 years     6 to 10 years     11 to 15 years     16 to 20 years     21 to 25 years  
 More than 25 years
6. Your Managerial level in the organisation  
 Lower Manager     Middle manager     Top manager
7. Your years of work in your Managerial level in the organisation  
 Less than 5 years     6 to 10 years     11 to 15 years     16 to 20 years     21 to 25 years  
 More than 25 years

8. Which of the following best describes your firm's industry?

- Logistics/Transportation  Mining/Extraction  Agricultural/Agribusiness  
 Manufacturing  Other Please specify.....

9. Type of ownership:

- Fully locally owned  Fully foreign owned  Jointly Ghanaian and foreign owned

10. Number of years the firm has been in operation:

- Less than 1 year  1-5 years  6-10 years  11-15 years  16-20 years  21 years and above

11. Number of employees in the firm:

- Less than 100 employees  100 to 200 employees  201 to 300 employees  301 to 400 employees  401 to 500 employees  501 to 1000 employees  More than 1000 employees

12. Firm Location:

- Northern Sector  Southern Sector  Other (Please Specify)  
 .....

**SECTION B: ENVIRONMENTAL TRAINING (ET)**

(Source: Teixeira et al., 2016 and Jabbour, 2015)

*Indicate the extent to which you agree or disagree with each statement as they apply to your organisation by checking the appropriate number from 1 to 7, using the following scale:*

**SCALE:** 1= "strongly disagree" 2= "Disagree", 3= "Somewhat Disagree", 4= "Indifferent/Not Sure, 5= "Somewhat Agree", 6= "Agree" to 7= "strongly agree"

Item	Statement	1	2	3	4	5	6	7
<b>Environmental Training (ET)</b>								
<b>In this organisation, the following are applicable</b>								
<b>ET1.</b>	The contents of Environmental Training (ET) are raised through a systematic analysis of training gaps and needs							
<b>ET2.</b>	The responsibilities and duties of official environmental trainers are precisely defined							
<b>ET3.</b>	Participants who receive Environmental Training (ET) have many opportunities to apply the acquired environmental knowledge							
<b>ET4.</b>	There is an adequate infrastructure (physical space, material, people) for the delivery of Environmental Training (ET)							
<b>ET5.</b>	Environmental Training (ET) sessions occur within the company							

<b>ET6</b>	Environmental Training (ET) sessions occur outside of the company								
<b>ET7.</b>	There are adequate performance assessments after attending Environmental Training (ET) sessions								
<b>ET8.</b>	The topics discussed during Environmental Training (ET) are appropriate and current for company activities								
<b>ET9.</b>	Environmental Training (ET) helps to enhance the operations of the organisation								
<b>ET10.</b>	Generally, participants are satisfied with the Environmental Training (ET) programs offered;								

### SECTION C: SUPPLIER ENVIRONMENTAL ORIENTATION (SEO)

(Source: (Banerjee, 2002; Bu et al., 2020; Saghiri, 2021))

Indicate the extent to which you agree or disagree with each statement as they apply to your organisation by checking the appropriate number from 1 to 7, using the following scale:  
**SCALE: 1= “strongly disagree” 2= “Disagree”, 3= “Somewhat Disagree”, 4= “Indifferent/Not Sure, 5= “Somewhat Agree”, 6= “Agree” to 7= “strongly agree”**

Item	Statement	1	2	3	4	5	6	7
<b>SUPPLIER ENVIRONMENTAL ORIENTATION (SEO)</b>								
<b>In this organisation, the following are applicable</b>								
SEO1	Our firm exerts concerted efforts to allow each supplier to understand the importance of environmental preservation.							
SEO2	Our firm request potential primary suppliers to provide evidence of all environmental licenses and permits							
SEO3	Our firm request potential primary suppliers to have an implemented environmental management systems (e.g., ISO 14001)							
SEO4	Our firm has environmental specialists who audit potential primary suppliers' plants							
SEO5	Our firm sends environmental questionnaires to existing primary suppliers to monitor their compliance.							
SEO6	Our firm asks existing primary suppliers to commit to waste reduction goals.							
SEO7	Our firm has environmental criteria for periodic evaluation of existing primary suppliers.							
SEO8	We achieve our environmental goals collectively with our main Suppliers							

SEO9	Our main suppliers' exchange information with us to improve environmental performance.								
SEO10	Our organisation asks suppliers to reduce packaging materials								

**SECTION D: Green Logistics Management Practices (GLMPs)**

*Source* (Agyabeng-Mensah, Ahenkorah, Afum, Dacosta, *et al.*, 2020) Baah, Jin and Tang, 2020, Saghiri, 2021)

Indicate the extent to which you agree or disagree with each statement as they apply to your organisation by checking the appropriate number from 1 to 7, using the following scale:  
**SCALE: 1= "strongly disagree" 2= "Disagree", 3= "Somewhat Disagree", 4= "Indifferent/Not Sure, 5= "Somewhat Agree", 6= "Agree" to 7= "strongly agree"**

Item	Statement	1	2	3	4	5	6	7
<b>Green Logistics Management Practices (GLMPs)</b>								
<b>In this organisation, the following are applicable</b>								
GLMP1	We consider environmental matters generally in our transport decisions							
GLMP2	We practice reduce, reuse and recycle							
GLMP3	We Promote the use of ecological materials for inner and outer packaging.							
GLMP4	We ensure enhanced sharing of environmental information across our logistics network							
GLMP5	We use sustainable transport methods to reduce CO2 emissions.							
GLMP6	We plan the routes of our vehicles in order to reduce environmental impact.							
GLMP7	We have invested in vehicles that are designed to have reduced environmental impacts.							
GLMP8	We cooperate with suppliers and customers to develop route networks							
GLMP9	We collect used products for recycling							
GLMP10	Our organisation buys from local suppliers to reduce transportation related pollution							

**SECTION E: TOP MANAGEMENT COMMITMENT (TMC)**

*Source* (Haldorai, Gon and Garcia, 2022)

Indicate the extent to which you agree or disagree with each statement as they apply to your organisation by checking the appropriate number from 1 to 7, using the following scale:  
**SCALE: 1= "strongly disagree" 2= "Disagree", 3= "Somewhat Disagree", 4= "Indifferent/Not Sure, 5= "Somewhat Agree", 6= "Agree" to 7= "strongly agree"**

Item	Statement	1	2	3	4	5	6	7
<b>TOP MANAGEMENT COMMITMENT (TMC)</b>								
<b>In this organisation, the following are applicable</b>								

<b>TMC1</b>	Top management in our organisation considers environmentally sustainable practices as a vital part of corporate strategy.								
<b>TMC2</b>	Top management at our company treats environmental protection as an important issue.								
<b>TMC3</b>	Preserving the environment is a central corporate value in our organisation								
<b>TMC4</b>	Top management at our company ensures that employees understand the importance of environmental preservation								
<b>TMC5</b>	Top management allocates sufficient resources to implement environmental projects								
<b>TMC6</b>	Top managers support efforts to develop environmental management practices								
<b>TMC7</b>	Top management at our company follows up on suggestions for improvement on environmental protection.								

**SECTION F: CORPORATE ENVIRONMENTAL ORIENTATION (CEO)**

*Source (Cao and Chen, 2019)*

Indicate the extent to which you agree or disagree with each statement as they apply to your organisation by checking the appropriate number from 1 to 7, using the following scale:  
**SCALE: 1= “strongly disagree” 2= “Disagree”, 3= “Somewhat Disagree”, 4= “Indifferent/Not Sure, 5= “Somewhat Agree”, 6= “Agree” to 7= “strongly agree”**

<b>Item</b>	<b>Statement</b>	1	2	3	4	5	6	7
<b>CORPORATE ENVIRONMENTAL ORIENTATION (CEO)</b>								
<b>In this organisation, the following are applicable</b>								
<b>CEO1</b>	Our organisation has a clear policy statement on environmental awareness in every area.							
<b>CEO2</b>	Preserving the environment is a central corporate value in our organisation							
<b>CEO3</b>	Environmental preservation is vital to our organisation’s survival							
<b>CEO4</b>	Our organisation’s responsibility to the environment is of greater importance than the responsibility to its stakeholders							
<b>CEO5</b>	Our organisation has a responsibility to preserve the environment							
<b>CEO6</b>	Environmental preservation is a high-priority activity in our organisation							

## APPENDIX II

**Table: Common Method Bias Variance**

Component	Total Variance Explained					
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14.063	32.706	32.706	14.063	32.706	32.706
2	6.922	16.097	48.803			
3	6.377	14.831	63.633			
4	4.390	10.210	73.844			
5	3.870	9.000	82.844			
6	.383	.891	83.735			
7	.354	.824	84.559			
8	.347	.808	85.366			
9	.327	.760	86.126			
10	.324	.753	86.879			
11	.301	.700	87.579			
12	.290	.675	88.253			
13	.277	.645	88.898			
14	.262	.610	89.508			
15	.258	.600	90.108			
16	.238	.554	90.662			
17	.235	.547	91.209			
18	.228	.531	91.741			
19	.218	.507	92.248			
20	.213	.495	92.743			
21	.211	.490	93.233			
22	.201	.466	93.700			
23	.193	.448	94.148			
24	.183	.425	94.573			

25	.176	.409	94.982		
26	.170	.395	95.377		
27	.165	.384	95.761		
28	.159	.369	96.130		
29	.156	.362	96.492		
30	.147	.342	96.834		
31	.142	.331	97.165		
32	.127	.295	97.460		
33	.121	.282	97.742		
34	.116	.269	98.011		
35	.113	.262	98.273		
36	.107	.250	98.522		
37	.104	.241	98.764		
38	.101	.235	98.998		
39	.093	.217	99.216		
40	.090	.209	99.425		
41	.085	.199	99.624		
42	.084	.194	99.818		
43	.078	.182	100.000		
Extraction Method: Principal Component Analysis.					

**Source: Field data, 2023**

